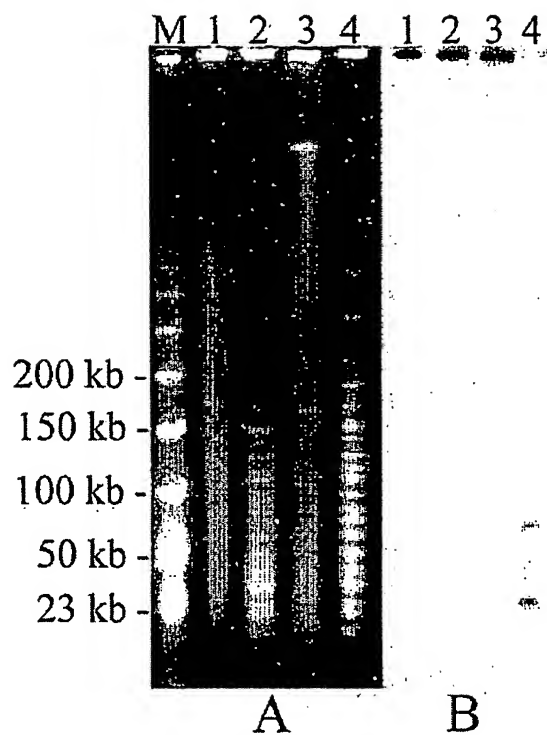FIGURE 1A   FIGURE 1B

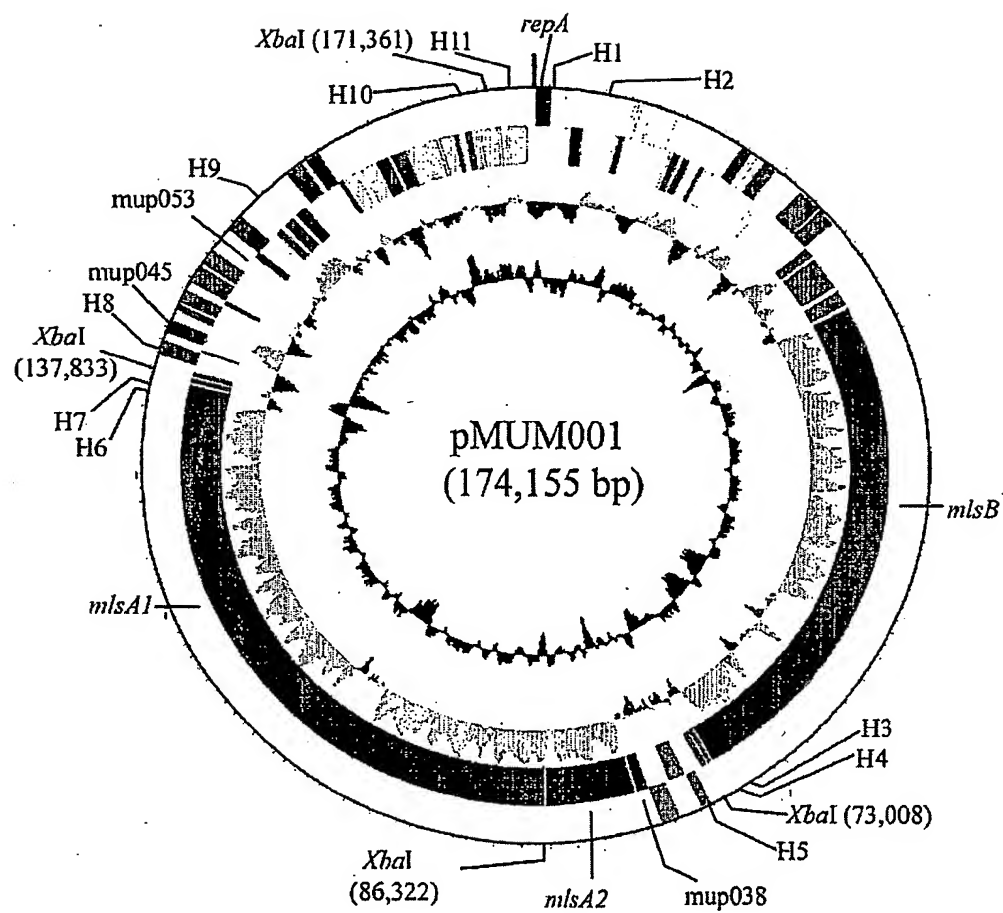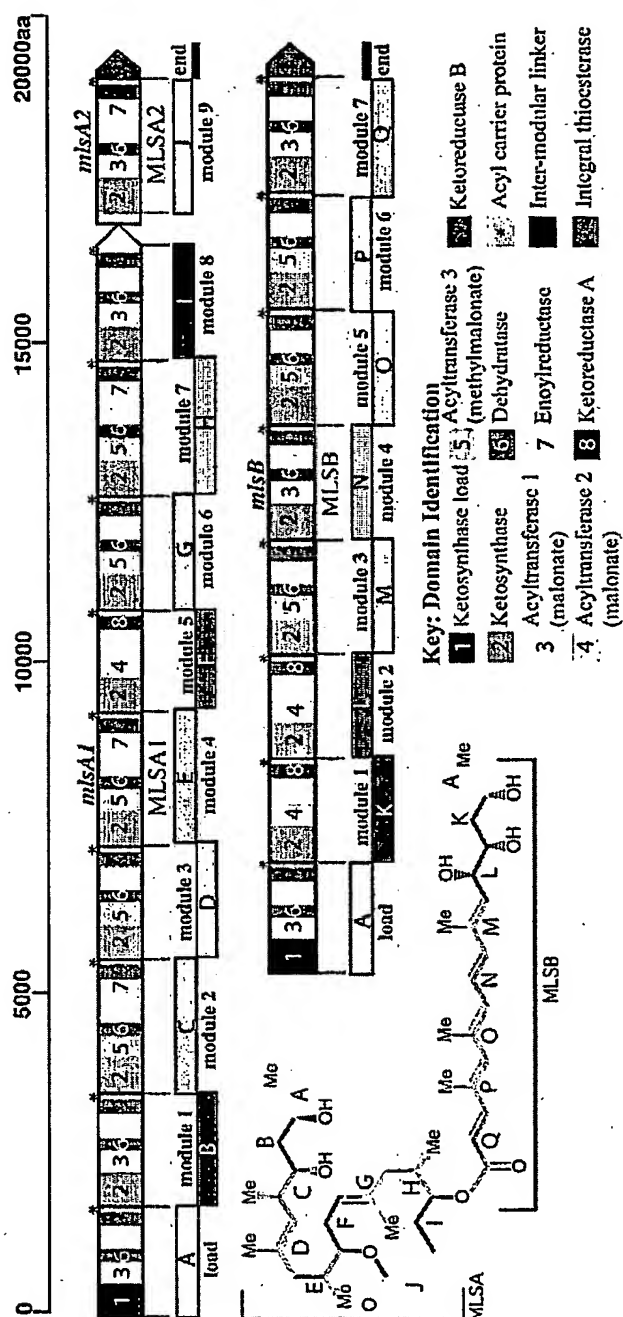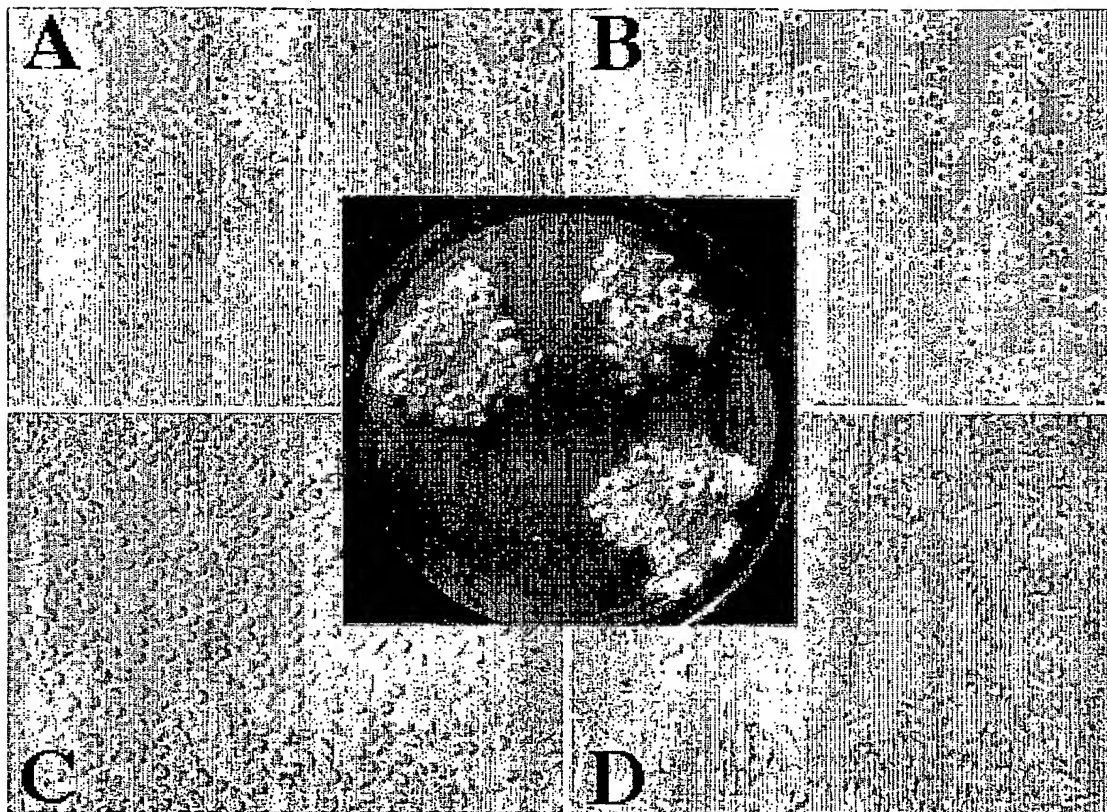**FIGURE 2**

FIGURE 3

FIGURE 4A　　　　　　　　　　　　　　　FIGURE 4B

FIGURE 4C　　　　　　　　　　　　　　　FIGURE 4D
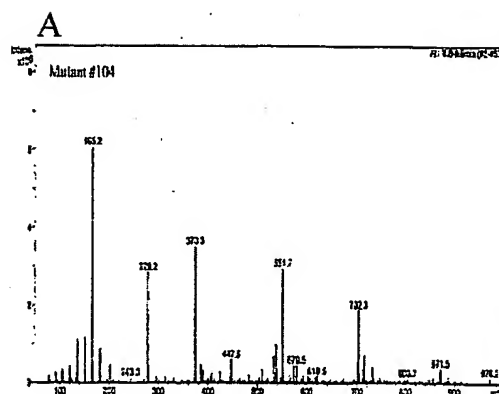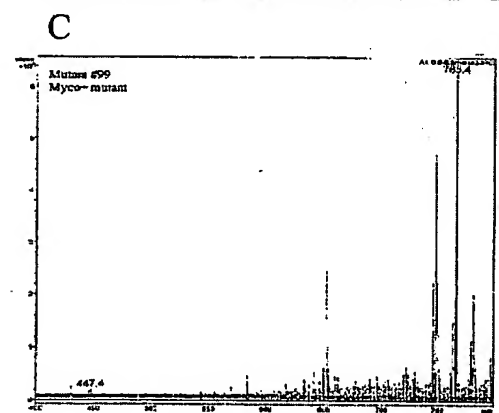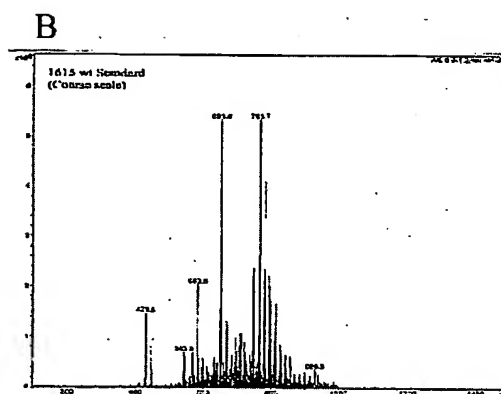
FIGURE 5A　　　　　　　　　　　**FIGURE 5B**

FIGURE 5C　　　　　　　　　　　**FIGURE 5D**
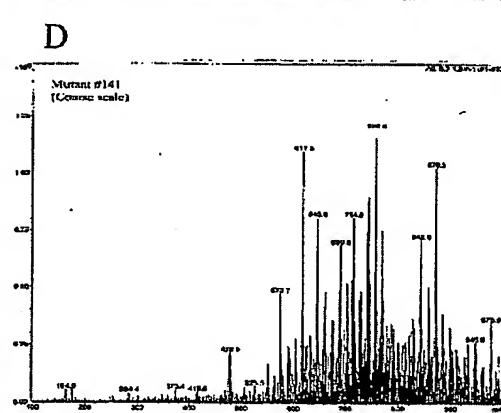
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1901  cggcgttgtt cgcgctggga accgctctac atcgattgtt cacccacgcc
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```

FIGURE 6

```
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FIGURE 6(continued)

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FIGURE 6(continued)

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FIGURE 6(continued)

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11901 ccaagccgcc gccggcgccg ccggtgtggt caagatgatc caagccatca
11951 cccacgccac cttgcccgcc accttgcacg tcgaccaacc cagcccccac
12001 atcgactggt ccagcggcac agtccgactc ctaaccgagc ccatccaatg
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12101 gcggcaccaa cgcccacctc atcctccaac aaccccccac ccccgacacc
12151 acacaaaccc ccaaccccac aacaggttct gatcccgcag tgggttctga
12201 ttccgcagtg ggttctgatc ccgcagtggg tgtactggtg tggccgttgt
12251 cagcgcgttc agcgccgggg ttaagcgcac aagcggcccg tctgtaccag
12301 catctcagcg cccaccccga tctggatccg atcgatgtag cccacagcct
12351 ggctaccaca cgcagccacc accccaccg cgccaccatc accaccagca
12401 ttgagcacca cagcgaaaac aaccacgaca caacgatgc gctggccgca
12451 ctgcacgccc tggccaacaa cggcacacac cccctgctga gcagaggcct
12501 gctgacccca cagggccccg gcaaaacagt gttcgtgttc cccggacagg
12551 gcagtcaata ccccggcatg ggcgcagatc tctaccgcca attccccgtg
12601 ttcgcccacg ccctcgacgc atgcgacgca gcgttacagc ctttcactgg
12651 atggtcggtg ctagctgtgt tacacgacga acccgaggcc ccgtcgttgg
12701 agcgagtcga tgtggtccag cctgtgttgt tctcggtgat ggtgtcgtta
12751 gccgcactct ggcggtgggc cggaatcacc cccgatgcag tcatcggcca
12801 ctcccagggc gagatcgccg cggcacatgt ggccggagcc ctgaccttgc
12851 ccgaagcagc tgcggtagtg gctttgcgca gccgtgtctt gaccgacctg
12901 gccggtgccg gtgccatggc ttcagtgcta tcgcccgagg aaccactgac
12951 ccagctgctg gcacggtggg acggcaagat cactgtcgcc gcagttaacg
13001 gccccgctag cgctgtggtc tccggcgata ccacagcgat caccgaattg
13051 ctgattacct gcgaacacga aaacatcgac gctcgcgcta tcccggtgga
13101 ctaccccctct cattcccct atatgaaca catccgccat cagttcctcg
13151 acgagctacc cgagctgaca ccgcggccat caaccatcgc gatgtattcc
13201 accgtcgacg gcgaacctca cgacaccgcc tacgacacca ccacaatgac
13251 cgcggactac tggtaccgca acatccgtaa cactgtccgg ttccatgaca
13301 ctgtcgctgc cctgctcggg gcgggtgagc aggttttcct ggaactttca
13351 cctcacccgg tgttgacaca agcgatcacc gacaccgtcg aacaagccgg
13401 cggcggcggc gcagcagtgc cagctctacg caaggatcgc cctgatgctg
13451 tcgcgttcgc tgcagcactc ggccagctgc actgccatgg catcagccca
13501 tcctggaatg ttctttactg ccaggcccgc ccctcacac tgcccaccta
13551 cgctttccag catcagcgtt actggctgct gcccaccgct ggtgatttca
13601 gcggggccaa tacccacgcc atgcatccgc tgctagacac cgccaccgaa
13651 ctggccgaaa accgcggatg ggtgttcacc ggccggatca gcccacgcac
13701 ccaaccatgg ctaaacgaac acgccgtcga atcagccgtg ctgttcccag
13751 gcaccggatt cgtcgagcta gcgctgcatg tcgctgaccg tgccggatat
13801 tcctcggtca acgaactgat cgtgcacacc cccctgctac tcgctggcca
13851 cgacaccgcg gatctacaga tcaccgtcac cgacaccgat gacatgggcc
13901 ggcagtctct taacatccac tcgcgcccac atatcggcca tgacaacacc
13951 accaccggcg atgaacaacc cgagtgggtc ctgcatgcca gcgcagtcct
14001 gaccgcacaa accaccgacc acaaccacct cccctaacg cctgtgccgt
14051 ggcctccacc cggcacagcc gcgatcgagg tggatgactt ctacgacgac
14101 ctggctgcac agggctacaa ctacggcccg acattccaag gtgtgcaacg
14151 gatatggcgt gaccacgcca cacccgatgt catctacgcc gaagttgaac
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FIGURE 6(continued)

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14201 tacccgaaga caccgacatc gacggctacg gcatccaccc cgccctattc
14251 gacgccgctt tacacccct actcgccctg acccaacccc ccaccaacga
14301 caccgatgac accaacaccg cagacaccgg tgaccaggtg cggctgccct
14351 acgcctttac cggcatcagt ttgcacgcca cccacgccac ccgattacgg
14401 gtacggctga cccgtaccgg cgccgatgcc atcaccgtgc acaccagtga
14451 caccaccgga gccccggtgg cgatcatcga ctcattgatc acccgccccc
14501 tcaccaccgc cacagggtct gctccggcaa ccacagcagc tggcctacta
14551 cacctgagct ggccaccaca ccctgacacc acgaccgaca ccgacaccga
14601 caccgatgcc ctgcggtatc aggtgatcgc cgaacccact caacaactgc
14651 cccgctacct gcacgaccta cacaccagca ccgacctgca caccagcacc
14701 accgaagcag acgtggttgt gtggccggta ccggtgccca gcaacgaaga
14751 gctccaggca caccaagcat ccgacaccgc ggtgtcttct cggatacaca
14801 ccctgacccg ccaaacactt accgtggtgc aggactggct cactcacccc
14851 gacaccaccg gcacccgact ggtcatcgtg acccgccacg gcgtcagcac
14901 cagtgcccac gacccggtcc ccgacctagc ccacgccgca gtgtggggcc
14951 tgatccgcag cgcccaaaac gaacaccccg gacgcttcac actgctcgac
15001 accgacgaca acaccaacag cgacaccctc accaccgccc taaccctgcc
15051 aacccgcgaa aaccaactgg ccatacgccg cgacaccatc cacatccccc
15101 gcctgacccg caccgctgtc ctgacaccac cggacagcgg cccctggcgc
15151 cttgacacca ccggcaaggg tgatctggcc aacctcgccc tgctaccgac
15201 cgcccacact gccctggcct ctggacaaat ccgtatcgat gtccgggccg
15251 ctggtttgaa ttttcacgac gtggtcgtcg cgttggggct aatccccgac
15301 gacggattcg gcggagaagc cgccggggtg atcagcgaga tcggtcccga
15351 cgtctacgga ttcgccgtgg gtgatgccgt gaccggcatg accgtctctg
15401 gtgcgtttgc ccccagcact gtcgctgatc accgcatggt gatgacgatc
15451 ccggcccggt ggtccttccc ccaagccgca tccataccgg tggtattcct
15501 gaccgcctac atcgctttgg ccgagatctc gggcctaagc cgagggcaac
15551 gagtgctgat ccatgccggc actggcggtg tgggtatggc tgcgattcaa
15601 ttggcacacc atttgggtgc cgaagtattc gccaccgcca gcgccgcgaa
15651 atggagcacc cttgaggcac tgggggtacc gcgcgaccat atcgcttcct
15701 cgcgtactct ggacttttcc aacgcattcc tcgatgccac caacggcgcc
15751 ggtgttgatg tcgtattgaa ctgcctcagt ggtgaattcg tcgaagcatc
15801 cctagccctg ctgccccgcg gtggccattt cgtcgaaatc ggcaaaaccg
15851 acatccgtga taccgaggtc atcgccgcaa cccatcccgg cgtcatttac
15901 cgcgccctcg atctgctcag cgtctccccc gatcacatcc agcgcacact
15951 ggcccaactg tccccactgt ttgccaccga caccctaaaa cccctaccga
16001 ccactaatta cagcatctac caagccatct cggccttacg tgacatgagt
16051 caagcccgtc acacaggcaa gatcgtgctc actcgcgccgg tggtggtaga
16101 tcctgagggc acggtgttga tcaccggggg gaccgggacg ctgggtgcct
16151 tgttcgccga gcatctggtt tctgcccatg gtgtccggca tctgttgttg
16201 acctcgcggc gcggacctca ggcccacggt gccaccgatc tgcagcagcg
16251 gctcaccgat ctaggtgctc atgtcaccat cacggcctgc gatatcagcg
16301 accccgaagc actggccgcc ctggtcaatt cagtgcccac acaacaccgt
16351 ttaaccgcgg tagtgcacac cgccgtggta ttggccgaca ccccggtcac
16401 cgagttgacc ggcgatcaac tcgaccaggt gctggccccc aaaatcgacg
16451 cggcatggca gctgcaccaa ctcacctacg aacacaacct gtctgcattc
16501 atcatgttct cgtccatggc cggaatgata ggcagtcccg gtctgggtaa
16551 ctacgcggca gccaacaccg cgttagatgc tctcgccgac taccgccacc
16601 gcctgggctt gcccgcgacc agcctggcct ggggctactg gcagacccgc
16651 accggtctca ccgcgcatct aaccgatgta gatctagccc gcatgacccg
16701 cctgggtttg atgcccatcg ccaccagcca cggactggcc ctgttcgatg
16751 ccgccctcgc caccggacag cccgtttcga taccgcgccc gatcaacacc
16801 cacacccctg gcccgacacgc ccgcgacaac accctggccc cgatcctgtc
16851 tgcgctgatc accacaccac ggcgccgggc ggcctctgcc gcaaccgatc
16901 tcgctgcccg cctcaacgga cttagccccc aacagcaaca acaaacactg
16951 gccaccctcg tggccgcggc caccgccacc gtgctgggcc accacacccc
17001 cgaaagcatc agcccagcca ccgcgttcaa agacctcgga atcgattcgc
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FIGURE 6(continued)

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17051 tgaccgccct tgaactgcgc aacaccctca cccacaacac cggcctcaac
17101 ctttcgtcca ctcttatctt cgatcacccc acaccccatg cggtggccga
17151 gcatctgctt gaacagatcc ctggcatcgg tgccctggtg ccggctccgg
17201 tggtgatcgc agctggtcgt accgaggagc cggtggcggt ggtggggatg
17251 gcgtgtcgtt tccccggtgg tgtcgcatca gcggatcagt tgtgggactt
17301 ggtgatcgct ggccgtgatg tggtgggtaa ttttccggcc gatcggggtt
17351 gggatgtgga gggactgttt gatcccgatc cggacgcggt cggcaaaacc
17401 tacaccgtt  acggcgcgtt ccttgacgat gcggcaggtt ttgatgccgg
17451 gttctttggg atctctccac gggaggcacg cgcgatggac ccccagcagc
17501 ggctgctgct ggaggtgtgc tgggaagcgc tagaaaccgc gggtattccc
17551 gcgcacacct tggccggcac ctccaccggg gtattcgtcg gagccggggc
17601 ccagtcctac ggcgccacca actccgatgg cgctgagggg tatgcgatga
17651 ccggcggcgc gatcagcgtc atgtccggcc gtatcgccta caccttgggc
17701 ctagaaggtc cagcgatcac cgttgacacc gcctgctcgt catcgctggt
17751 ggcaattcac ctggcctgcc aatccttacg caacaacgaa tcccagctag
17801 cactggccgg cggcgtcacc gtgatgagca cacctgcgat tttcaccgag
17851 ttctcccgcc aacgcggcct ggccccagat ggacgctgca aagccttcgc
17901 cgctaccgcc gatggcaccg gctttggtga aggcgccgcg gtcttggtcc
17951 ttgaacggct ctccgaggcc cgccgcaaca accacccggt ccttgcgatc
18001 gtcgctggat cggcgatcaa ccaagacggc gcatccaacg gactgaccgc
18051 accccacggc ccgtcacaac aacgcgtcat caaccaagca ctagccaacg
18101 ccggcctcac ccacgaccag gtcgacgccg tcgaagccca cggcaccggc
18151 accacactgg gtgaccccat cgaagccagc gccctacacg ccacctacgg
18201 ccaccaccac acgcccgatc aaccgctttg gctgggatcc atcaaatcca
18251 acatcggcca cacccaagcc gccgccggcg ccgccggtgt ggtcaagatg
18301 atccaagcca tcacccacgc caccttgccc gccaccttgc acgtcgacca
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18401 agcccatcca atggcccaac accgaccacc cccgaccacc ggcggtgtcc
18451 tcattcggca tcagcggcac caacgcccac ctcatcctcc aacaaccccc
18501 caccccgac  accacacaaa cccccaacac cacaacaggt tctgatcccg
18551 cagtgggttc tgattccgca gtgggttctg atcccgcagt gggtgtactg
18601 gtgtggccgt tgtcagcgcg ttcagcgccg gggttaagcg cacaagcggc
18651 ccgtctgtac cagcatctca gcgcccaccc cgatctggat ccgatcgatg
18701 tagcccacag cctggctacc acacgcagcc accacccca ccgcgccacc
18751 atcaccacca gcattgagca ccacagcgaa aacaaccacg acacaaccga
18801 tgcgctggcc gcactgcacg ccctggccaa caacggcaca cacccctgc
18851 tgagcagagg cctgctgacc ccacagggcc ccggcaaaac agtgttcgtg
18901 ttccccggac agggcagtca ataccccggc atgggcgcag atctctaccg
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19151 cagtcatcgg ccactcccag ggcgagatcg ccgcggcaca tgtggccgga
19201 gccctgacct tgcccgaagc agctgcggta gtggctttgc gcagccgtgt
19251 cttgaccgac ctggccggtg ccggtgccat ggcttcagtg ctatcgcccg
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19351 gccgcagtta acggccccgc tagcgctgtg gtctccggcg ataccacagc
19401 gatcaccgaa ttgctgatta cctgcgaaca cgaaaacatc gacgctcgcg
19451 ctatcccggt ggactacccc tctcattccc cctatatgga acacatccgc
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19601 ccaccacaat gaccgcggac tactggtacc gcaacatccg taacactgtc
19651 cggttccatg acactgtcgc tgccctgctc ggggcgggtg agcaggtttt
19701 cctggaactt tcacctcacc cggtgttgac acaagcgatc accgacaccg
19751 tcgaacaagc cggcggcggc ggcgcagcag tgccagctct acgcaaggat
19801 cgccctgatg ctgtcgcgtt cgctgcagca ctcggccagc tgcactgcca
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FIGURE 6(continued)

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19851 tggcatcagc ccatcctgga atgttcttta ctgccaggcc cgcccctca
19901 cactgcccac ctacgctttc cagcatcagc gttactggct gctgcccacc
19951 gctggtgatt tcagcggggc caatacccac gccatgcatc cgctgctaga
20001 caccgccacc gaactggccg aaaaccgcgg atgggtgttc accggccgga
20051 tcagcccacg cacccaacca tggctaaacg aacacgccgt cgaatcagcc
20101 gtgctgttcc caggcaccgg atttgtcgag ctagcgctgc atgtcgctga
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20251 gatgacatgg gccggcagtc tcttaacatc cactcgcgcc cacatatcgg
20301 ccatgacaac accaccaccg gcgatgaaca acccgagtgg gtcctgcatg
20351 ccagcgcagt cctgaccgca caaaccaccg accacaacca cctcccccta
20401 acgcctgtgc cgtggcctcc acccggcaca gccgcgatcg aggtggatga
20451 cttctacgac gacctggctg cacagggcta caactacggc ccgacattcc
20501 aaggtgtgca acggatatgg cgtgaccacg ccacacccga tgtcatctac
20551 gccgaagttg aactacccga agacaccgac atcgacggct acggcatcca
20601 ccccgcccta ttcgacgccg ctttacaccc cctactcgcc ctgacccaac
20651 cccccaccaa cgacaccgat gacaccaaca ccgcagacac cggggaccag
20701 gtgcggctgc cctacgcctt taccggcatc agtttgcacg ccacccacgc
20751 cacccgattg cgggtacggc tgacccgtac cggcgccgat gccatcaccg
20801 tgcacaccag tgacaccacc ggagccccgg tggcgatcat cgactcattg
20851 atcacccgcc ccctcaccac cgccacaggg tctgctccgg caaccacagc
20901 agctggccta ctacacctga gctggccacc acccctgac accacgaccg
20951 acaccgacac cgacaccgat gccctgcggt atcgggtgat cgccgaaccc
21001 actcaacaac tgccccgcta cctgcacgac ctacacacca gcaccgacct
21051 gcacaccagc accaccgaag cagacgtggt tgtgtggccg gtaccggtgc
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21151 tctcggatac acaccctgac ccgccaaaca cttaccgtgg tgcaggactg
21201 gctcactcac cccgacacca ccggcaccccg actggtcatc gtgacccgcc
21251 acggcgtcag caccagtgcc cacgacccgg tccccgacct agcccacgcc
21301 gcagtgtggg gcctgatccg cagcgcccaa aacgaacacc cggacgctt
21351 cacactgctc gacaccgacg acaacaccaa cagcgacacc ctcaccaccg
21401 ccctaacccct gccaacccgc gaaaaccaac tggccatacg ccgcgacacc
21451 atccacatcc cccgcctgac ccgacacagc agtgacggtg cgctcactgc
21501 gccggtggtg gtagatcctg agggcacggt gttgatcacc gggggggaccg
21551 ggacgctggg tgccttgttc gccgagcatc tggtttctgc ccatggtgtc
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21651 cgatctgcag cagcggctca ccgatctagg tgctcatgtc accatcacgg
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22001 ccgactaccg ccaccgcctg ggcttgcccg cgaccagcct ggcctggggc
22051 tactggcaga ctcacaccgg tctcaccgcg catctaaccg atgtagatct
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22451 tcggaatcga ttcgctgacc gcccttgaac tgcgcaacac cctcaccccac
22501 aacaccggcc tggatctgcc ccccaccctc atcttcgatc accccacacc
22551 caccgcgcta acccaacacc tgcacacccg actcaccacc ggtgccctgg
22601 tgccggctcc ggtggtgatc gcagctggtc gtaccgagga gccggtggcg
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FIGURE 6(continued)

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22651 gtggtgggga tggcgtgtcg tttccccggt ggtgtcgcat cagcggatca
22701 gttgtgggac ttggtgatcg ctggccgtga tgtggtgggt aattttccgg
22751 ccgatcgggg ttgggatgtg gagggactgt ttgatcccga tccggacgcg
22801 gtcggcaaaa cctacacccg ttacggcgcg ttccttgacg atgcggcagg
22851 ttttgatgcc gggttctttg ggatctctcc acgggaggca cgcgcgatgg
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22951 gcgggtattc ccgcgcacac cttggccggc acctccaccg gggtattcgt
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23101 tacaccttgg gcctagaagg tccagcgatc accgttgaca ccgcctgctc
23151 gtcatcgctg gtggcaattc acctggcctg ccaatcctta cgcaacaacg
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23701 gtggtcaaga tgatccaagc catcacccac gccaccttgc ccgccacctt
23751 gcacgtcgac caacccagcc cccacatcga ctggtccagc ggcacagtcc
23801 gactcctaac cgagcccatc caatggccca acaccgacca cccccgcacc
23851 gcggcggtgt cctcattcgg catcagcggc accaacgccc acctcatcct
23901 ccaacaaccc cccaccccccg acaccacaca aaccccaac accacaacag
23951 gttctgatcc cgcagtgggt tctgatcccg cagtgggtgt actggtgtgg
24001 ccgttgtcag cgcgttcagc gccggggtta agcgcacaag cggccgtct
24051 gtaccagcat ctcagcgccc accccgatct ggatccgatc gatgtagccc
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24151 accagcattg agcaccacag cgaaaacaac cacgacacaa ccgatgcgct
24201 ggccgcactg cacgccctgg ccaacaacgg cacacacccc ctgctgagca
24251 gaggcctgct gaccccacag ggccccggca aaacagtgtt cgtgttcccc
24301 ggacagggca gtcaataccc cggcatgggc gcagatctct accgccaatt
24351 ccccgtgttc gcccacgccc tcgacgcatg cgacgcagcg ttacagcctt
24401 tcactggatg gtcggtgcta gctgtgttac acgacgaacc cgaggccccg
24451 tcgttggagc gggtcgatgt ggtccagcct gtgttgttct cggtgatggt
24501 gtcgttagcc gcactctggc ggtgggccgg aatcacccccc gatgcagtca
24551 tcggccactc ccagggcgag atcgccgcgg cacatgtggc cggagccctg
24601 accttgcccg aagcagctgc ggtagtggct ttgcgcagcc gtgtcttgac
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24701 cactgaccca gctgctggca cggtgggacg gcaagatcac tgtcgccgca
24751 gttaacggcc ccgctagcgc tgtggtctcc ggcgatacca cagcgatcac
24801 cgaattgctg attacctgcg aacacgaaaa catcgacgct cgcgctatcc
24851 cggtggacta cccctctcat tcccccctata tggaacacat ccgccatcag
24901 ttcctcgacg agctacccga gctgacaccg cggccatcaa ccatcgcgat
24951 gtattccacc gtcgacggcg aacctcacga caccgcctac gacaccacca
25001 caatgaccgc ggactactgg taccgcaaca tccgtaacac tgtccggttc
25051 catgacactg tcgctgccct gctcggggcg ggtgagcagg ttttcctgga
25101 actttcacct cacccggtgt tgacacaagc gatcaccgac accgtcgaac
25151 aagccggcgg cggcggcgca gcagtgccag ctctacgcaa ggatcgccct
25201 gatgctgtcg cgttcgctgc agcactcggc cagctgcact gccatggcat
25251 cagcccatcc tggaatgttc tttactgcca ggcccgcccc ctcacactgc
25301 ccacctacgc tttccagcat cagcgttact ggctgctgcc caccgctggt
25351 gatttcagcg gggccaatac ccacgccatg catccgctgc tagacaccgc
25401 caccgaactg gccgaaaacc gcggatgggt gttcaccggc cggatcagcc
```

FIGURE 6(continued)

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25451 cacgcaccca accatggcta aacgaacacg ccgtcgaatc agccgtgctg
25501 ttcccaggca ccggatttgt cgagctagcg ctgcatgtcg ctgaccgtgc
25551 cggatattcc tcggtcaacg aactgatcgt gcacaccccc ctgctactcg
25601 ctggccacga caccgcggat ctacagatca ccgtcaccga caccgatgac
25651 atgggccggc agtctcttaa catccactcg cacccacata tcggccatga
25701 caacaccacc accggcgatg aacaacccga gtgggtcctg catgccagcg
25751 cagtcctgac cgcacaaacc accgaccaca accacctccc cctaacgcct
25801 gtgccgtggc ctccacccgg cacagccgcg atcgaggtgg atgacttcta
25851 cgacgacctg gctgcacagg gctacaacta cggcccgaca ttccaaggtg
25901 tgcaacggat atggcgtgac cacgccacac ccgatgtcat ctacgccgaa
25951 gttgaactac ccgaagacac cgacatcgac ggctacggca tccacccccgc
26001 cctattcgac gccgctttac accccctact cgccctgacc caacccccca
26051 ccaacgacac cgatgacacc aacaccgcag acaccggtga ccaggtgcgg
26101 ctgccctacg cctttaccgg catcagtttg cacgccaccc acgccacccg
26151 attgcgggta cggctgaccc gtaccggcgc cgatgccatc accgtgcaca
26201 ccagtgacac caccggagcc ccggtggcga tcatcgactc attgatcacc
26251 cgcccctca ccaccgccac agggtctgct ccggcaacca cagcagctgg
26301 cctactacac ctgagctggc caccacaccc tgacaccacg accgacaccg
26351 acaccgacac cgatgccctg cggtatcagg tgatcgccga acccactcaa
26401 caactgcccc gctacctgca cgacctacac accagcaccg acctgcacac
26451 cagcaccacc gaagcagacg tggttgtgtg gccggtaccg gtgcccagca
26501 acgaagagct ccaggcacac caagcatccg acaccgcggt gtcttctcgg
26551 atacacaccc tgacccgcca aacacttacc gtggtgcagg actggctcac
26601 tcaccccgac accaccggca cccgactggt catcgtgacc cgccacggcg
26651 tcagcaccag tgcccacgac ccggtccccg acctagccca cgccgcagtg
26701 tggggcctga tccgcagcgc ccaaaacgaa caccccggac gcttcacact
26751 gctcgacacc gacgacaaca ccaacagcga caccctcacc accgccctaa
26801 ccctgccaac ccgcgaaaac caactggcca tacgccgcga caccatccac
26851 atccccgcc tgacccgcac cgctgtcctg acaccaccgg acagcggccc
26901 ctggcgcctt gacaccaccg gcaagggtga tctggccaac ctcgccctgc
26951 taccgaccgc ccacactgcc ctggcctctg gacaaatccg tatcgatgtc
27001 cgggccgctg gtttgaattt tcacgacgtg gtcgtcgcgt tggggctaat
27051 ccccgacgac ggattcggcg gagaagccgc cggggtgatc agcgagatcg
27101 gtcccgacgt ctacggattc gccgtggggtg atgccgtgac cggcatgacc
27151 gtctctggtg cgtttgcccc cagcactgtc gctgatcacc gcatggtgat
27201 gacgatcccg gcccggtggt ccttccccca agccgcatcc ataccggtgg
27251 tattcctgac cgcctacatc gctttggccg agatctcggg cctaagccga
27301 gggcaacgag tgctgatcca tgccggcact ggcggtgtgg gtatggctgc
27351 gattcaattg gcacaccatt tgggtgccga agtattcgcc accgccagcg
27401 ccgcgaaatg gagcaccctt gaggcactgg gggtaccgcg cgaccatatc
27451 gcttcctcgc gtactctgga ctttttccaac gcattcctcg atgccaccaa
27501 cggcgccggt gttgatgtcg tattgaactg cctcagtggt gaattcgtcg
27551 aagcatccct agccctgctg ccccgcggtg gccatttcgt cgaaatcggc
27601 aaaaccgaca tccgtgatac cgaggtcatc gccgcaaccc atcccggcgt
27651 catttaccgc gccctcgatc tgctcagcgt ctcccccgat cacatccagc
27701 gcacactggc ccaactgtcc ccactgtttg ccaccgacac cctaaaaccc
27751 ctaccgacca ctaattacag catctaccaa gccatctcgg ccttacgtga
27801 catgagtcaa gcccgtcaca caggcaagat cgtgctcact gcgccggtgg
27851 tggtagatcc tgagggcacg gtgttgatca ccggggggac cgggacgctg
27901 ggtgccttgt cgccgagca tctggtttct gcccatggtg tccggcatct
27951 gttgttgacc tcgcggcgcg gacctcaggc ccacggtgcc accgatctgc
28001 agcagcggct caccgatcta ggtgctcatg tcaccatcac ggcctgcgat
28051 atcagcgacc ccgaagcact ggccgccctg gtcaattcag tgcccacaca
28101 acaccgttta accgcggtag tgcacaccgc cgcggtattg gccgacaccc
28151 cggtcaccga gttgaccggc gatcaactcg accaggtgct ggcccccaaa
28201 atcgacgcgg catggcagct gcaccaactc acctacgaac acaacctgtc
28251 tgcattcatc atgttctcgt ccatggccgg aatgataggc agtcccggtc
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FIGURE 6(continued)

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28301 agggtaacta cgcggcagcc aacaccgcgt tagatgctct cgccgactac
28351 cgccaccgcc tgggcttgcc cgcgaccagc ctggcctggg gctactggca
28401 gactcacacc ggtctcaccg cgcatctaac cgatgtagat ctagcccgca
28451 tgacccgcct gggtttgatg cccatcgcca ccagccacgg actggccctg
28501 ttcgatgccg ccctcgccac cggacagccc gtttcgatac ccgccccgat
28551 caacacccac accctggccc gacacgcccg cgacaacacc ctggccccga
28601 tcctgtctgc gctgatcacc acaccacggc gccgggcggc ctctgccgca
28651 accgatctcg ctgcccgcct caacggactt agcccccaac agcaacaaca
28701 aacactggcc accctcgtgg ccgcggccac cgccaccgtg ctgggccacc
28751 acacccccga aagcatcagc ccagccaccg cgttcaaaga cctcggaatc
28801 gattcgctga ccgcccttga actgcgcaac accctcaccc acaacaccgg
28851 cctcaacctt tcgtccactc ttatcttcga tcaccccaca ccccatgcgg
28901 tggccgagca tctgcttgaa cagatccctg gcatcggtgc cctggtgccg
28951 gctccggtgg tgatcgcagc tggtcgtacc gaggagccgg tggcggtggt
29001 ggggatggcg tgtcgtttcc ccggtggtgt cgcatcagcg gatcagttgt
29051 gggacttggt gatcgctggc cgtgatgtgg tgggtaattt tccggccgat
29101 cggggttggg atgtggaggg actgtttgat cccgatccgg acgcggtcgg
29151 caaaacctac acccgttacg gcgcgttcct tgacgatgcg gcaggttttg
29201 atgccgggtt ctttgggatc tctccacggg aggcacgcgc gatggacccc
29251 cagcagcggc tgctgctgga ggtgtgctgg gaagcgctag aaaccgcggg
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29351 ccggggccca gtcctacggc gccaccaact ccgatgacgc tgaggggtat
29401 gcgatgaccg gcggcgcgac tagcgtcatg tccggccgta tcgcctacac
29451 cttgggccta gaaggtccag cgatcaccgt tgacaccgcc tgctcgtcat
29501 cgctggtggc aattcacctg gcctgccaat ccttacgcaa caacgaatcc
29551 cagctagcac tggccggcgg cgtcaccgtg atgagcacac ctgcggtttt
29601 caccgagttc tcccgccaac gcggcctggc cccagatgga cgctgcaaag
29651 ccttcgccgc taccgccgat ggcaccggct ttggtgaagg cgccgcggtc
29701 ttggtccttg aacggctctc cgaggcccgc cgcaacaacc acccggtcct
29751 tgcgatcgtc gctggatcgg cgatcaacca agacggcgca tccaacggac
29801 tgaccgcacc ccacggcccg tcacaacaac gcgtcatcaa ccaagcacta
29851 gccaacgccg gcctcaccca cgaccaggtc gacgccgtcg aagcccacgg
29901 caccggcacc acactgggtg accccatcga agccggcgcc ctacacgcca
29951 cctacggcca ccaccacacg cccgatcaac cgctttggct gggatccatc
30001 aaatccaaca tcggccacac ccaagccgcc gccggccgcg ccggtgtggt
30051 caagatgatc caagccatca cccacgccac cttgcccgcc accttgcacg
30101 tcgaccaacc cagcccccac atcgactggt ccagcggcac agtccgactc
30151 ctaaccgagc ccatccaatg gcccaacacc gaccacccccc gcaccgcggc
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30251 aacccccccac ccctaacccc acacaaaccc ccgaggactg cagccccgca
30301 caatctccct gcgcaacaat caccgatgca ggcacgggat tatcgtttgt
30351 gccctgggtg atttcagcga agtcggctga ggcgttgtct cgcgcaggcga
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30451 ctggggtggt cattgatagc cactcgatcg atgtttgagc atcgcgcagt
30501 agttgtgggt gcggatcgtc accagttgca gcgcggggttg gccgagttgg
30551 cttctggtaa cttgggcgcc gatgtagtgg tgggccgggc ccgcgcagcg
30601 ggcgagactg taatggtgtt tcccggtcag ggatcacagc ggttgggcat
30651 gggcgcgcag ctttatgaac aattcccggt attcgcggcg gcgtttgatg
30701 acgttgttga tgcgctggac cagtatctgc ggttgccgct acgccaagtt
30751 atgtggggtg acgatgaagg cctgctcaat tcaacggagt tcgcccagcc
30801 gtcgttgttt gctgtcgagg tcgcactgtt tgcgttgctg cgcttctggg
30851 gtgtcgttcc ggattacgtg ataggccatt cggtaggaga gctggccgct
30901 gcacaagtgg ctggcgtttt gagcctgcag gacgcggcta aattagtttc
30951 agcgcggggc cgactgatgc aggccctgcc cgccggtgga gcgatggtcg
31001 cggtagccgc cagccagcat gaagtcgagc ctttgctggt tgaaggggtc
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FIGURE 6(continued)

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31051 gatatcgcgg cgctcaatgc gccagggtca gttgtgatct ctggtgatca
31101 ggcggcagtc cgtttgatcg ctaatcgatt ggcggatagg ggctacaggg
31151 cgcacgaact tgcggtttcg catgcctttc attcatcgtt gatggagccg
31201 atgttggagg agttcgctcg gctcgcttct gaaatcgttg tggagcaacc
31251 gcagattcca ctgatttcga acgtgactgg tcagctggcc aacgccgact
31301 acgggtcggc aggttactgg gtggaccaca tccgccgtcc agtccgtttc
31351 gccgatagtg tcgcttcgtt ggaagccatg ggggctagct gcttcattga
31401 agtcggtcca gccagcgggt tgggcgcagc tatcgagcaa tccttgaaat
31451 ctgccgagcc gaccgtgtca gtgtcggcac tgtccaccga taaacctgaa
31501 tccgtcgccg tattgcgcgc tgcagcacga ctttccacct ccggcattcc
31551 tgtggattgg cagtcggtgt tcgacggccg cagcacccag acagttaacc
31601 tgcccaccta cgccttccag cggcaacggt tctggctcga cgccaaccgt
31651 atcggtcaag gcgatcccgc cagtcaacca caggcccaga acgttgaatc
31701 ccgttttttgg gaggcggtcg agcgggaaga cgttgatggc ttggctgatt
31751 ctataggtgt caccgccagt gccatgcaga ccgtgctacc tgcattgtct
31801 tcatggcgtc gcgcggagcg cacacagtcc gagcttgatt cctggcgcta
31851 tcaggtgaca tggctgtctt ccccagcaac gccgagttcg atcacgctgt
31901 ccggcatttg gttgctgata gttccaagcg aacttgcaaa gactgaccca
31951 gtaattggat gtgctgcagc gctcgaagcg cacggcgcct tagtcacgat
32001 tatcacaatt ttcgagccgg acttcaatcg ctcattgatg ggcgcttccc
32051 taaaagatat cggttcacac atatctggtg tcatatcgtt cttagggatt
32101 cacgggtccg aattctccga tagcggcgcg gtcaagacat taaatcttgt
32151 gcaagcaatg ggcgatgtcc acttagacgt tcctttgtgg tgcctaacgc
32201 agggcgcggt atcgatcagc gccgacgatt tgatccgatg ctcgtcagca
32251 gccctggtgt ggggtctggg gagagtcgtc gcattagagc acccgggatc
32301 gtggggtggc ttagtagacc tccccgagtc acccgacgat gcagcatggg
32351 agcgcttgtg cgccctcctc gcgcagccga cggatgaaga tcagtttgcg
32401 atcaggccgt ctggggtttt cctacggaga ttgatccacg ccccggcaac
32451 cacgacatcc aaatcctcga ccgcgtgggc tccgaggggg accgtgttaa
32501 tcacaggcgg cacaggcgcg ttaggcgcac acgtcgcaag gtggttggcc
32551 cacaaatatg aatcggtaga tttgctctta accagccgtc gcgggatggc
32601 agccgatgga gctacagagc tagtggatga cctccgcacg gctggcgcca
32651 gtgtgacagt gcacgcctgc gacgtgacag accgcacttc agtcgaggct
32701 gcaatagcag gtaaatccct tgatgcggtc tttcatcttg caggacgaca
32751 ccagccaact ctgctaacag aactcgagga cgaatccttt agtgacgaat
32801 tggcgccgaa ggttcacggt gcccaagtat tgagtgacat cacgtctaac
32851 ctcacactat cagcgtttgt catgttctcg tcagtagccg gaatctgggg
32901 cggcaaaagt caaggcgcat atgctgccgc taacgcattc ttagattcgc
32951 tcgccgagaa acggcgcacg ttggggttac cagcaacatc ggtcgcttgg
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33451 ctccaaactg cgaccggcct caacctttcg tccactctta tcttcgatca
33501 ccccacaccc catgcggtgg ccgagcatct gcttgaacag atccctggca
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33601 gagccggtgg cggtggtggg gatggcgtgt cgtttccccg gtggtgtcgc
33651 atcagcggat cagttgtggg acttggtgat cgctggccgt gatgtggtgg
33701 gtaattttcc ggccgatcgg ggttgggatg tggagggact gtttgatccc
33751 gatccggacg cggtcggcaa aacctacacc cgttacggcg cgttccttga
33801 cgatgcggca ggttttgatg ccgggttctt tgggatctct ccacgggagg
33851 cacgcgcgat ggaccccccag cagcggctgc tgctggaggt gtgctgggaa
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FIGURE 6(continued)

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33901 gcgctagaaa ccgcgggtat tcccgcgcac accttggccg gcacctccac
33951 cggggtattc gccggagcct gggcccagtc ctacggcgcc accaactccg
34001 atgacgctga ggggtatgcg atgaccggcg gctcgactag cgtcatgtcc
34051 ggccgtatcg cctacacctt gggcctagaa ggtccagcga tcaccgttga
34101 caccgcctgc tcgtcatcgc tggtggcaat tcacctggcc tgccaatcct
34151 tacgcaacaa cgaatcccag ctagcactgg ccggcggcgt caccgtgatg
34201 agcacacctg cgattttcac cgagttctcc cgccaacgcg gcctggcccc
34251 agatggacgc tgcaaagcct tcgccgctac cgccgatggc accggctttg
34301 gtgaaggcgc cgcggtcttg gtccttgaac ggctctccga ggcccgccgc
34351 aacaaccacc cggtccttgc gatcgtcgct ggatcggcga tcaaccaaga
34401 cggcgcatcc aacggactga ccgcacccca cggcccgtca caacaacgcg
34451 tcatcaacca agcactagcc aacgccggcc tcacccacga ccaggtcgac
34501 gccgtcgaag cccacggcac cggcaccaca ctgggtgacc ccatcgaagc
34551 cagcgcccta cacgccacct acggccacca ccacacgccc gatcaaccgc
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34751 gcggcacagt ccgactccta accgagccca tccaatggcc caacaccgac
34801 cacccccgca ccgcggcggt gtcctcattc ggcatcagcg gcaccaacgc
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34901 acaccacaac aggttctgat cccgcagtgg gttctgatcc cgcagtgggt
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35151 aaccgatgcg ctggccgcac tgcacgccct ggccaacaac ggcacacacc
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35251 ttcgtgttcc ccggacaggg cagtcaatac cccggcatgg gcgcagatct
35301 ctaccgccaa ttccccgtgt tcgcccacgc cctcgacgca tgcgacgcag
35351 cgttacagcc tttcactgga tggtcggtgc tagctgtgtt acacgacgaa
35401 cccgaggccc cgtcgttgga gcgggtcgat gtggtccagc ctgtgttgtt
35451 ctcggtgatg gtgtcgttag ccgcactctg gcggtgggcc ggaatcaccc
35501 ccgatgcagt catcggccac tcccagggcg agatcgccgc ggcacatgtg
35551 gccggagccc tgaccttgcc cgaagcagct gcggtagtgg ctttgcgcag
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35701 actgtcgccg cagttaacgg ccccgctagc gctgtggtct ccggcgatac
35751 cacagcgatc accgaattgc tgattacctg cgaacacgaa aacatcgacg
35801 ctcgcgctat cccggtggac tacccctctc attcccccta tatggaacac
35851 atccgccatc agttcctcga cgagctaccc gagctgacac cgcggccatc
35901 aaccatcgcg atgtattcca ccgtcgacgg cgaacctcac gacaccgcct
35951 acgacaccac cacaatgacc gcggactact ggtaccgcaa catccgtaac
36001 actgtccggt tccatgacac tgtcgctgcc ctgctcgggg cgggtgagca
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36101 acaccgtcga acaagccggc ggcggcggcg cagcagtgcc agctctacgc
36151 aaggatcgcc ctgatgctgt cgcgttcgct gcagcactcg gccagctgca
36201 ctgccatggc atcagcccat cctggaatgt tctttactgc caggcccgcc
36251 ccctcacact gcccacctac gctttccagc atcagcgtta ctggctgctg
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36351 gctagacacc gccaccgaac tggccgaaaa ccgcggatgg gtgttcaccg
36401 gccggatcag cccacgcacc caaccatggc taaacgaaca cgccgtcgaa
36451 tcagccgtgc tgttcccagg caccggattt gtcgagctag cgctgcatgt
36501 cgctgaccgt gccggatatt cctcggtcaa cgaactgatc gtgcacaccc
36551 ccctgctact cgctggccac gacaccgcgg atctacagat caccgtcacc
36601 gacaccgatg acatgggccg gcagtctctt aacatccact cgcacccaca
36651 tatcggccat gacaacacca ccaccggcga tgaacaaccc gagtgggtcc
36701 tgcatgccag cgcagtcctg accgcacaaa ccaccgacca caaccacctc
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FIGURE 6(continued)

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36751 cccctaacgc ctgtgccgtg gcctccaccc ggcacagccg cgatcgaggt
36801 ggatgacttc tacgacgacc tggctgcaca gggctacaac tacggcccga
36851 cattccaagg tgtgcaacgg atatggcgtg accacgccac acccgatgtc
36901 atctacgccg aagttgaact acccgaagac accgacatcg acggctacgg
36951 catccacccc gccctattcg acgccgcttt acacccccta ctcgccctga
37001 cccaaccccc caccaacgac accgatgaca ccaacaccgc agacaccggg
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37101 ccacgccacc cgattacggg tacggctgac ccgtaccggc gccgatgcca
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37201 tcattgatca cccgccccct caccaccgcc acagggtctg ctccggcaac
37251 cacagcagct ggcctactac acctgagctg gccaccacac cctgacacca
37301 cgaccgacac cgacaccgac accgatgccc tgcggtatca ggtgatcgcc
37351 gaacccactc aacaactgcc ccgctacctg cacgacctac acaccagcac
37401 caccgaagca gacgtggttg tgtggccggt accggtgccc agcaacgaag
37451 agctccaggc acaccaagca tccgacaccg cggtgtcttc tcggatacac
37501 accctgaccc gccaaacact taccgtggtg caggactggc tcactcaccc
37551 cgacaccacc ggcacccgac tggtcatcgt gacccgccac ggcgtcagca
37601 ccagtgccca cgacccggtc cccgacctag cccacgccgc agtgtggggc
37651 ctgatccgca gcgcccaaaa cgaacacccc ggacgcttca cactgctcga
37701 caccgacgac aacaccaaca gcgacaccct caccaccgcc ctaaccctgc
37751 caacccgcga aaaccaactg gccatacgcc gcgacaccat ccacatcccc
37801 cgcctgaccc gacacagcag tgacggtgcg ctcactgcgc cggtggtggt
37851 agatcctgag ggcacggtgt tgatcaccgg ggggaccggg acgctgggtg
37901 ccttgttcgc cgagcatctg gtttctgccc atggtgtccg gcatctgttg
37951 ttgacctcgc ggcgcggacc tcaggcccac ggtgccaccg atctgcagca
38001 gcggctcacc gatctaggtg ctcatgtcac catcacggcc tgcgatatca
38051 gcgaccccga agcactggcc gccctggtca attcagtgcc cacacaacac
38101 cgtttaaccg cggtagtgca caccgccgcg gtattggccg acaccccggt
38151 caccgagttg accggcgatc aactcgacca ggtgctggcc cccaaaatcg
38201 acgcggcatg gcagctgcac caactcacct acgaacacaa cctgtctgca
38251 ttcatcatgt tctcgtccat ggccggaatg ataggcagtc ccggtcaggg
38301 taactacgcg gcagccaaca ccgcgttaga tgctctcgcc gactaccgcc
38351 accgcctggg cttgcccgcg accagcctgg cctggggcta ctggcagact
38401 cacaccggtc tcaccgcgca tctaaccgat gtagatctag cccgcatgac
38451 ccgcctgggt ttgatgccca tcgccaccag ccacggactg gccctgttcg
38501 atgccgccct cgccaccgga cagcccgttt cgatacccgc cccgatcaac
38551 acccacaccc tggcccgaca cgcccgcgac aacaccctgg ccccgatcct
38601 gtctgcgctg atcaccacac cacggcgccg ggcggcctct gccgcaaccg
38651 atctcgctgc ccgcctcaac ggacttagcc cccaacagca acaacaaaca
38701 ctggccaccc tcgtggccgc ggccaccgcc accgtgctgg gccaccacac
38751 ccccgaaagc atcagcccag ccaccgcgtt caaagacctc ggaatcgatt
38801 cgctgaccgc ccttgaactg cgcaacaccc tcacccacaa caccggcctg
38851 gatctgcccc ccaccctcat cttcgatcac cccacacccc atgcggtggc
38901 cgagcatctg cttgaacaga tccctggcat cggtgccctg gtgccggctc
38951 cggtggtgat cgcagctggt cgtaccgagg agccggtggc ggtggtgggg
39001 atggcgtgtc gtttccccgg tggtgtcgca tcagcggatc agttgtggga
39051 cttggtgatc gctggccgtg atgtggtggg taattttccg gccgatcggg
39101 gttgggatgt ggagggactg tttgatcccg atccggacgc ggtcggcaaa
39151 acctacaccc gttacggcgc gttccttgac gatgcggcag gtttttgatgc
39201 cgggttcttt gggatctctc cacgggaggc acgcgcgatg accccccagc
39251 agcggctgct gctggaggtg tgctgggaag cgctagaaac cgcgggtatt
39301 cccgcgcaca ccttggccgg cacctccacc ggggtattcg ccggagcctg
39351 ggcccagtcc tacggcgcca ccaactccga tgacgctgag gggtatgcga
39401 tgaccggcgg ctcgactagc gtcatgtccg gccgtatcgc ctacaccttg
39451 ggcctagaag gtccagcgat caccgttgac accgcctgct cgtcatcgct
39501 ggtggcaatt cacctggcct gccaatcctt acgcaacaac gaatcccagc
39551 tagcactggc cggcggcgtc accgtgatga gcacacctgc ggttttcacc
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FIGURE 6(continued)

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39601 gagttctccc gccaacgcgg cctggcccca gatggacgct gcaaagcctt
39651 cgccgctacc gccgatggca ccggctttgg tgaaggcgcc gcggtcttgg
39701 tccttgaacg gctctccgag gcccgccgca acaaccaccc ggtccttgcg
39751 atcgtcgctg gatcggcgat caaccaagac ggcgcatcca acggactgac
39801 cgcaccccac ggcccgtcac aacaacgcgt catcaaccaa gcactagcca
39851 acgccggcct cacccacgac caggtcgacg ccgtcgaagc ccacggcacc
39901 ggcaccacac tgggtgaccc catcgaagcc agcgccctac acgccaccta
39951 cggccaccac cacacgcccg atcaaccgct ttggctggga tccatcaaat
40001 ccaacatcgg ccacacccaa gccgccgccg gcgccgccgg tgtggtcaag
40051 atgatccaag ccatcacccа cgccaccttg cccgccacct tgcacgtcga
40101 ccaacccagc ccccacatcg actggtccag cggcacagtc cgactcctaa
40151 ccgagcccat ccaatggccc aacaccgacc accccgcac cgcggcggtg
40201 tcctcattcg gcatcagcgg caccaacgcc cacctcatcc tccaacaacc
40251 ccccacccc gacaccacac aaaccccaa caccacaaca ggttctgatc
40301 ccgcagtggg ttctgatccc gcagtggtg tactggtgtg gccgttgtca
40351 gcgcgttcag cgccgggtt aagcgcacaa gcggcccgtc tgtaccagca
40401 tctcagcgcc caccccgatc tggatccgat cgatgtagcc cacagcctgg
40451 ctaccacacg cagccaccac ccccaccgcg ccaccatcac caccagcatt
40501 gagcaccaca gcgaaaacaa ccacgacaca accgatcgc tggccgcact
40551 gcacgccctg gccaacaacg gcacacaccc cctgctgagc agaggcctgc
40601 tgaccccaca gggccccggc aaaacagtgt cgtgttccc cggacagggc
40651 agtcaatacc ccggcatggg cgcagatctc taccgccaat tccccgtgtt
40701 cgcccacgcc ctcgacgcat gcgacgcagc gttacagcct ttcactggat
40751 ggtcggtgct agctgtgtta cacgacgaac ccgaggcccc gtcgttggag
40801 cgggtcgatg tggtccagcc tgtgttgttc tcggtgatgg tgtcgttagc
40851 cgcactctgg cggtgggccg gaatcacccc cgatgcagtc atcggccact
40901 cccagggcga gatcgccgcg gcacatgtgg ccggagccct gaccttgccc
40951 gaagcagctg cggtagtggc tttgcgcagc cgtgtcttga ccgacctggc
41001 cggtgccggt gccatggctt cagtgctatc gcccgaggaa ccactgaccc
41051 agctgctggc acggtgggac ggcaagatca ctgtcgccgc agttaacggc
41101 cccgctagcg ctgtggtctc cggcgatacc acagcgatca ccgaattgct
41151 gattacctgc gaacacgaaa acatcgacgc tcgcgctatc ccggtggact
41201 acccctctca ttcccccat atggaacaca tccgccatca gttcctcgac
41251 gagctacccg agctgacacc gcggccatca accatcgcga tgtattccac
41301 cgtcgacggc gaacctcacg acaccgccta cgacaccacc acaatgaccg
41351 cggactactg gtaccgcaac atccgtaaca ctgtccggtt ccatgacact
41401 gtcgctgccc tgctcggggc gggtgagcag gttttcctgg aactttcacc
41451 tcacccggtg ttgacacaag cgatcaccga caccgtcgaa caagccggcg
41501 gcggcggcgc agcagtgcca gctctacgca aggatcgccc tgatgctgtc
41551 gcgttcgctg cagcactcgg ccagctgcac tgccatggca tcagcccatc
41601 ctggaatgtt ctttactgcc aggcccgccc cctcacactg cccacctacg
41651 ctttccagca tcagcgttac tggctgctgc ccaccgctgg tgatttcagc
41701 ggggccaata cccacgccat gcatccgctg ctagacaccg ccaccgaact
41751 ggccgaaaac cgcggatggg tgttcaccgg ccggatcagc ccacgcaccc
41801 aaccatggct aaacgaacac gccgtcgaat cagccgtgct gttcccaggc
41851 accggatttg tcgagctagc gctgcatgtc gctgaccgtg ccggatattc
41901 ctcggtcaac gaactgatcg tgcacacccc cctgctgctc gctggccacg
41951 acaccgcgga tctacagatc accgtcaccg acaccgatga catgggccgg
42001 cagtctctta acatccactc gcgcccacat atcggccatg acaacaccac
42051 caccggcgat gaacaacccg agtgggtcct gcatgccagc gcagtcctga
42101 ccgcacaaac caccgaccac aaccacctcc ccctaacgcc tgtgccgtgg
42151 cctccacccg gcacagccgc gatcgaggtg gatgacttct acgacgacct
42201 ggctgcacag ggctacaact acggcccgac attccaaggt gtgcaacgga
42251 tatgcgtga ccacgccaca cccgatgtca tctacgccga agttgaacta
42301 cccgaagaca ccgacatcga cggctacggc atccaccccg ccctattcga
42351 cgccgcttta caccccctac tcgccctgac ccaacccccc accaacgaca
42401 ccgatgacac caacaccgca gacaccggtg accaggtgcg gctgccctac
```

FIGURE 6(continued)

```
42451  gcctttaccg  gcatcagttt  gcacgccacc  cacgccaccc  gattacgggt
42501  acggctgacc  cgtaccggcg  ccgatgccat  caccgtgcac  accagtgaca
42551  ccaccggagc  cccggtggcg  atcatcgact  cattgatcac  ccgcccctc
42601  accaccgcca  cagggtctgc  tccggcaacc  acagcagctg  gcctactaca
42651  cctgagctgg  ccaccacacc  ctgacaccac  gaccgacacc  gacaccgaca
42701  ccgatgccct  gcggtatcag  gtgatcgccg  aacccactca  acaactgccc
42751  cgctacctgc  acgacctaca  caccagcacc  gacctgcaca  ccagcaccac
42801  cgaagcagac  gtggttgtgt  ggccggtacc  ggtgcccagc  aacgaagagc
42851  tccaggcaca  ccaagcatcc  gacaccgcgg  tgtcttctcg  gatacacacc
42901  ctgacccgcc  aaacacttac  cgtggtgcag  gactggctca  ctcaccccga
42951  caccaccggc  acccgactgg  tcatcgtgac  ccgccacggc  gtcagcacca
43001  gtgcccacga  cccggtcccc  gacctagccc  acgccgcagt  gtggggcctg
43051  atccgcagcg  cccaaaacga  acaccccgga  cgcttcacac  tgctcgacac
43101  cgacgacaac  accaacagcg  acaccctcac  caccgcccta  accctgccaa
43151  cccgcgaaaa  ccaactggcc  atacgccgcg  acaccatcca  catcccccgc
43201  ctgacccgca  ccgctgtcct  gacaccaccg  gacagcggcc  cctggcgcct
43251  tgacaccacc  ggcaagggtg  atctggccaa  cctcgccctg  ctaccgaccg
43301  cccacactgc  cctggcctct  ggacaaatcc  gtatcgatgt  ccgggccgct
43351  ggtttgaatt  ttcacgacgt  ggtcgtcgcg  ttggggctaa  tccccgacga
43401  cggattcggc  ggagaagccg  ccggggtgat  cagcgagatc  ggtcccgacg
43451  tctacggatt  cgccgtgggt  gatgccgtga  ccggcatgac  cgtctctggt
43501  gcgtttgccc  ccagcactgt  cgctgatcac  cgcatggtga  tgacgatccc
43551  ggcccggtgg  tccttccccc  aagccgcatc  cataccggtg  gtattcctga
43601  ccgcctacat  cgctttggcc  gagatctcgg  gcctaagccg  agggcaacga
43651  gtgctgatcc  atgccggcac  tggcggtgtg  ggtatggctg  cgattcaatt
43701  ggcacaccat  ttgggtgccg  aagtattcgc  caccgccagc  gccgcgaaat
43751  ggagcaccct  tgaggcactg  ggggtaccgc  gcgaccatat  cgcttcctcg
43801  cgtactctgg  acttttccaa  cgcattcctc  gatgccacca  acggcgccgg
43851  tgttgatgtc  gtattgaact  gcctcagtgg  tgaattcgtc  gaagcatccc
43901  tagccctgct  gccccgcggt  ggccatttcg  tcgaaatcgg  caaaaccgac
43951  atccgtgata  ccgaggtcat  cgccgcaacc  catcccggcg  tcatttaccg
44001  cgccctcgat  ctgctcagcg  tctcccccga  tcacatccag  cgcacactgg
44051  cccaactgtc  cccactgttt  gccaccgaca  ccctaaaacc  cctaccgacc
44101  actaattaca  gcatctacca  agccatctcg  gccttacgtg  acatgagtca
44151  agcccgtcac  acaggcaaga  tcgtgctcac  tgcgccggtg  gtggtagatc
44201  ctgagggcac  ggtgttgatc  accggggggga  ccgggacgct  gggtgccttg
44251  ttcgccgagc  atctggtttc  tgcccatggt  gtccggcatc  tgttgttgac
44301  ctcgcggcgc  ggacctcagg  cccacggtgc  caccgatctg  cagcagcggc
44351  tcaccgatct  aggtgctcat  gtcaccatca  cggcctgcga  tatcagcgac
44401  cccgaagcac  tggccgccct  ggtcaattca  gtgcccacac  aacaccgttt
44451  aaccgcggta  gtgcacaccg  ccgcggtatt  ggccgacacc  ccggtcaccg
44501  agttgaccgg  cgatcaactc  gaccaggtgc  tggcccccaa  aatcgacgcg
44551  gcatggcagc  tgcaccaact  cacctacgaa  cacaacctgt  ctgcattcat
44601  catgttctcg  tccatggccg  gaatgatagg  cagtcccggt  cagggtaact
44651  acgcggcagc  caacaccgcg  ttagatgctc  tcgccgacta  ccgccaccgc
44701  ctgggcttgc  ccgcgaccag  cctggcctgg  ggctactggc  agacccgcac
44751  cggtgtcacc  gcgcatctaa  ccgatgtaga  tctagcccgc  atgacccgcc
44801  tgggtttgat  gcccatcgcc  accagccacg  gactggccct  gttcgatgcc
44851  gccctcgcca  ccggacagcc  cgtttcgata  cccgccccga  tcaacaccca
44901  caccctggcc  cgacacgccc  gcgacaacac  cctgaccccg  atcctgtctg
44951  cgctgatcac  cacaccacgg  cgccgggcgg  cctctgccgc  aaccgatctc
45001  gctgcccgcc  tcaacggact  tagcccccaa  cagcaacaac  aaacactggc
45051  caccctcgtg  gccgcggcca  ccgccaccgt  gctgggccac  cacacccccg
45101  aaagcatcag  cccagccacc  gcgttcaaag  acctcggaat  cgattcgctg
45151  accgcccttg  aactgcgcaa  caccctcacc  cacaacaccg  gcctggatct
45201  gccccccacc  ctcatcttcg  atcaccccac  acccaccgcg  ctaacccaac
45251  acctgcacac  ccgactcacc  accggtgccc  tggtgccggc  tccggtggtg
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FIGURE 6(continued)

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45301 atcgcagctg gtcgtaccga ggagccggtg gcggtggtgg ggatggcgtg
45351 tcgtttcccc ggtggtgtcg catcagcgga tcagttgtgg gacttggtga
45401 tcgctggccg tgatgtggtg ggtaattttc cggccgatcg gggttgggat
45451 gtggcgggac tgtttgatcc cgatccggac gcggtcggca aaacctacac
45501 ccgttacggc gcgttccttg acgatgcggc aggttttgat gccgggttct
45551 ttgggatctc tccacgggag gcacgcgcga tggaccccca gcagcggctg
45601 ctgctggagg tgtgctggga agcgctagaa accgcgggta ttcccgcgca
45651 caccttggcc ggcacctcca ccggggtatt cgtcggagcc ggggcccagt
45701 cctacggcgc caccaactcc gatgacgctg aggggtatgc gatgaccggc
45751 ggcgcgatca gcgtcatgtc cggccgtatc gcctacacct tgggcctaga
45801 aggtccagcg atcaccgttg acaccgcctg ctcgtcatcg ctggtggcaa
45851 ttcacctggc ctgccaatcc ttacgcaaca acgaatccca gctagcactg
45901 gccggcggcg tcaccgtgat gagcacacct gcggttttca ccgatttctc
45951 ccgccaacgc ggcctggccc cagatggacg ctgcaaagcc ttcgccgcta
46001 ccgccgatgg caccggcttt ggtgaaggcg ccgcggtctt ggtccttgaa
46051 cggctctccg aggcccgccg caacaaccac ccggtccttg cgatcgtcgc
46101 tggatcggcg atcaaccaag acggcgcatc caacggactg accgcacccc
46151 acggcccgtc acaacaacgc gtcatcaacc aagcactagc caacgccggc
46201 ctcacccacg accaggtcga cgccgtcgaa gcccacggca ccggcaccac
46251 actgggtgac cccatcgaag ccggcgccct acacgccacc tacggccacc
46301 accacacgcc cgatcaaccg ctttggctgg gatccatcaa atccaacatc
46351 ggccacaccc aagccgccgc cggcgccgcc ggtgtggtca agatgatcca
46401 agccatcacc cacgccacct gcccgccac cttgcacgtc gaccaaccca
46451 gcccccacat cgactggtcc agcggcacag tccgactcct aaccgagccc
46501 atccaatggc ccaacaccga ccacccccgc accgcggcgg tgtcctcatt
46551 cggcatcagc ggcaccaacg cccacctcat cctccaacaa ccccccaccc
46601 ccgacaccac acaaaccccc aaccccacaa caggttctga tcccgcagtg
46651 ggttctgatt ccgcagtggg ttctgatccc gcagtgggtg tactggtgtg
46701 gccgttgtca gcgcgttcag cgccggggtt aagcgcacaa gcggcccgtc
46751 tgtaccagca tctcagcgcc cacccgatc tggatccgat cgatgtagcc
46801 cacagcctgg ctaccacacg cagccaccac ccccaccgcg ccaccatcac
46851 caccagcatt gagcaccaca gcgaaaacaa ccacgacaca accgatgcgc
46901 tggccgcact gcacgccctg gccaacaacg gcacacaccc cctgctgagc
46951 agaggcctgc tgacccccaca gggccccggc aaaacagtgt tcgtgttccc
47001 cggacagggc agtcaatacc ccggcatggg cgcagatctc taccgccaat
47051 tccccgtgtt cgcccacgcc ctcgacgagg tcgctgcggc gctgaacccg
47101 catctcgatg ttgcgttgct tgaggtgatg ttcagccaac aagacactgc
47151 catggcgcaa ctgctggacc agaccttcta tgcacaaccg gcgttgttcg
47201 cgctgggaac cgctctacat cgattgttca cccacgccgg tatccaccg
47251 gactaccgc taggccactc catcggagaa ctcaccgcg catacgccgc
47301 cggtgtgctg tcactgcaag acgcagccac cttggtcaca agccgaggac
47351 gactgatgca atcctgcacg cccggcggga cgatgctcgc actacaagcc
47401 agcgaagcag aagtacaacc gctgcttgaa ggcctagacc acgccgtgtc
47451 catcgccgcg atcaacggag caacgtcgat cgtactgtca ggagatcacg
47501 acagcctcga acaaatcggc gagcacttca ttacccaaga tcgacgtacc
47551 acccgactgc aggtcagtca cgctttccac tctccacata tggaccccat
47601 cctcgaacaa ttccgccaga tcgcggccca actcaccttc agcgcaccca
47651 ccctgcccat cttgtccaac ctcaccgggc agatcgcccg ccacgaccaa
47701 ctcgcctcac ctgactattg gacccaacag ctacgtaaca ctgtccggtt
47751 ccatgacact gtcgctgccc tgctcggggc gggtgagcag gttttcctgg
47801 aactttcacc tcaccccggtg ttgacacaag cgatcaccga caccgtcgaa
47851 caagccggcg gcggcggcgc agcagtgcca gctctacgca aggatcgccc
47901 tgatgctgtc gcgttcgctg cagcactcgg ccagctgcac tgccatggca
47951 tcagcccatc ctggaatgtt ctttactgcc aggcccgccc cctcacactg
48001 cccacctacg ctttccagca tcagcgttac tggctgctgc ccaccgctgg
48051 tgatttcagc ggggccaata cccacgccat gcatccgctg ctagacaccg
48101 ccaccgaact ggccgaaaac cgcggatggg tgttcaccgg ccggatcagc
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FIGURE 6(continued)

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48151 ccacgcaccc aaccatggct aaacgaacac gccgtcgaat cagccgtgct
48201 gttcccgaac accggatttg tcgagctagc gctgcatgtc gctgaccgtg
48251 ccggatattc ctcggtcaac gaactgatcg tgcacacccc cctgctgctc
48301 gctggccacg acaccgcgga tctacagatc accgtcaccg acaccgatga
48351 catgggccgg cagtctctta acatccactc gcgcccacat atcggccatg
48401 acaacaccac caccggcgat gaacaacccg agtgggtcct gcatgccagc
48451 gcagtcctga ccgcacaaac caccgaccac aaccacctcc ccctaacgcc
48501 tgtgccgtgg cctccacccg gcacagccgc gatcgaggtg gatgacttct
48551 acgacgacct ggctgcacag ggctacaact acggcccgac attccaaggt
48601 gtgcaacgga tatggcgtga ccacgccaca cccgatgtca tctacgccga
48651 agttgaacta cccgaagaca ccgacatcga cggctacggc atccacccccg
48701 ccctattcga cgccgcttta cacccccctac tcgccctgac ccaacccccc
48751 accaacgaca ccgatgacac caacaccgca gacaccgggg accaggtgcg
48801 gctgccctac gcctttaccg gcatcagttt gcacgccacc cacgccaccc
48851 gattgcgggt acggctgacc cgtaccggcg ccgatgccat caccgtgcac
48901 accagtgaca ccaccggagc cccggtggcg atcatcgact cattgatcac
48951 ccgcccgctc accaccgcca cagggtctgc tccggcaacc acagcagctg
49001 gcctactaca cctgagctgg ccaccacacc ctgacaccac gaccgacacc
49051 gacaccgaca ccgacaccga tgccctgcgg tatcaggtga tcgccgaacc
49101 cactcaacaa ctgccccgct acctgcacga cctacacacc agcaccgacc
49151 tgcacaccag caccaccgaa gcagacgtgg ttgtgtggcc ggtaccggtg
49201 cccagcaacg aagagctcca ggcacaccaa gcatccgaca ccgcggtgtc
49251 ttctcggata cacaccctga cccgccaaac acttaccgtg gtgcaggact
49301 ggctcactca ccccgacacc accggcaccc gactggtcat cgtgacccgc
49351 cacggcgtca gcaccagtgc ccacgacccg gtccccgacc tagcccacgc
49401 cgcagtgtgg ggcctgatcc gcagcgccca aaacgaacac cccggacgct
49451 tcacactgct cgacaccgac gacaacacca acagcgacac cctcaccacc
49501 gccctaaccc tgccaacccg cgaaaaccaa ctggccatac gccgcgacac
49551 catccacatc ccccgcctga cccgacacag cagtgacggt gcgctcactg
49601 cgccggtggt ggtagatcct gagggcacgg tgttgatcac cggggggacc
49651 gggacgctgg gtgccttgtt cgccgagcat ctggtttctg cccatggtgt
49701 ccggcatctg ttgttgacct cgcggcgcgg acctcaggcc cacggtgcca
49751 ccgatctgca gcagcggctc accgatctag gtgctcatgt caccatcacg
49801 gcctgcgata tcagcgaccc cgaagcactg gccgccctgg tcaattcagt
49851 gcccacacaa caccgtttaa ccgcggtagt gcacaccgcc gcggtattgg
49901 ccgacacccc ggtcaccgag ttgaccggcg atcaactcga ccaggtgctg
49951 gcccccaaaa tcgacgcggc atggcagctg caccaactca cctacgaaca
50001 caacctgtct gcattcatca tgttctcgtc catggccgga atgataggca
50051 gtcccggtca gggtaactac gcggcagcca acaccgcgtt agatgctctc
50101 gccgactacc gccaccgcct gggcttgccc gcgaccagcc tggcctgggg
50151 ctactggcag actcacaccg gtctcaccgc gcatctaacc gatgtagatc
50201 tagcccgcat gacccgcctg ggtttgatgc ccatcgccac cagccacgga
50251 ctggccctgt tcgatgccgc cctcgccacc ggacagcccg tttcgatacc
50301 cgccccgatc aacacccaca ccctggcccg acacgcccgc gacaacaccc
50351 tggccccgat cctgtctgcg ctgatcacca caccacggcg ccgggcggcc
50401 tctgccgcaa ccgatctcgc tgcccgcctc aacggactta gcccccaaca
50451 gcaacaacaa acactggcca ccctcgtggc cgcggccacc gccaccgtgc
50501 tgggccacca caccccgaa agcatcagcc cagccaccgc gttcaaagac
50551 ctcggaatcg attcgctgac cgcccttgaa ctgcgcaaca ccctcaccca
50601 caacaccggc ctggatctgc cccccaccct catcttcgat cacccacac
50651 ccaccgcgct aacccaacac ctgcacaccc gactcacaca aattgagagc
50701 ccaaattccg aagactcgat gctgaacctt aaaaatttgg accgaattga
50751 atcatatatc ttcagaaatt cgggagaaga tcgagctcac gtaatcgcta
50801 atcgtttacg gtcaattctc tcgaaatggg atggcacccg tagtccagaa
50851 ttacctgcgg aactccatct tgaatcggca acagacgatg agctgttttc
50901 cctagcaaac atgtttcgca ctccaaccag cgaaatttca cctactctag
50951 aaggcggccg tggtgtcaac tga
```

FIGURE 6(continued)

MlsA2 gene
```
1    gtggtgtcaa ctgaagaaaa cctacgcgtt tacttaaaac aggtcatcac
51   agacctccac caaatgcagg cacgtctgcg gaagatcgaa aagcagagat
101  cagagcgggt ggcggtggtg gggatggcgt gtcgtttccc cggtggtgtc
151  gcatcagcgg atcagttgtg ggacttggtg atcgctggcc gtgatgtggt
201  gggtaatttt ccggccgatc ggggttggga tgtggaggga ctgtttgatc
251  ccgatccgga cgcggtcggc aaaacctaca cccgttacgg cgcgttcctt
301  gacgatgcgg caggttttga tgccgggttc tttgggatct ctccacggga
351  ggcacgcgcg atggaccccc agcagcggct gctgctggag gtgtgctggg
401  aagcgctaga aaccgcgggt attcccgcgc acaccttggc cggcacctcc
451  accggggtat tcgtcggagc ctgggcccag tcctacggcg ccaccaactc
501  cgatggcgct gaggggtatg cgatgaccgg cggctcgact agcgtcatgt
551  ccggccgtat cgcctacacc ttgggcctag aaggtccagc gatcaccgtt
601  gacaccgcct gctcgtcatc gctggtggca attcacctgg cctgccaatc
651  cttacgcaac aacgaatccc agctagcact ggccggcggc gtcaccgtga
701  tgagcacacc tgcggttttc accgagttct cccgccaacg cggcctggcc
751  ccagatggac gctgcaaagc cttcgccgct accgccgatg gcaccggctg
801  gggtgaaggc gccgcggtct tggtccttga acggctctcc gaggcccgcc
851  gcaacaacca cccggtcctt gcgatcgtcg ctggatcggc gatcaaccaa
901  gacggcgcat ccaacggact gaccgcaccc cacggcccgt cacaacaacg
951  cgtcatcaac caagcactag ccaacgccgg cctcacccac gaccaggtcg
1001 acgccgtcga agcccacggc accggcacca cactgggtga ccccatcgaa
1051 gccagcgccc tacacgccac ctacggccac caccacacgc ccgatcaacc
1101 gctttggctg ggatccatca aatccaacat cggccacacc caagccgccg
1151 ccggcgccgc cggtgtggtc aagatgatcc aagccatcac ccacgccacc
1201 ttgcccgcca ccttgcacgt cgaccaaccc agcccccaca tcgactggtc
1251 cagcggcaca gtccgactcc taaccgagcc catccaatgg cccaacaccg
1301 accacccccg caccgcggcg gtgtcctcat tcggcatcag cggcaccaac
1351 gcccacctca tcctccaaca acccccccacc cccgacacca cacaaacccc
1401 caacaccaca acaggttctg atcccgcagt gggttctgat tccgcagtgg
1451 gttctgatcc cgcagtgggt gtactggtgt ggccgttgtc agcgcgttca
1501 gcgccggggt taagcgcaca agcggcccgt ctgtaccagc atctcagcgc
1551 ccaccccgat ctggatccga tcgatgtagc ccacagcctg gctaccacac
1601 gcagccacca ccccaccgc gccaccatca ccaccagcat tgagcaccac
1651 agcgaaaaca accacgacac aaccgatgcg ctggccgcac tgcacgccct
1701 ggccaacaac ggcacacacc ccctgctgag cagaggcctg ctgacccccac
1751 agggcccccgg caaaacagtg ttcgtgttcc ccggacaggg cagtcaatac
1801 cccggcatgg gcgcagatct ctaccgccaa ttccccgtgt tcgcccacgc
1851 cctcgacgag gtcgctgcgg cgctgaaccc gcatctcgat gttgcgttgc
1901 ttgaggtgat gttcagccaa caagacactg ccatggcgca actgctggac
1951 cagaccttct atgcacaacc ggcgttgttc gcgctgggaa ccgctctaca
2001 tcgattgttc acccacgccg gtatccaccc ggactacctg ctaggccact
2051 ccatcggaga actcaccgcg gcatacgccg ccggtgtgct gtcactgcaa
2101 gacgcagcca ccttggtcac aagccgagga cgactgatgc aatcctgcac
2151 gcccggcggg acgatgctcg cactacaagc cagcgaagca gaagtacaac
2201 cgctgcttga aggcctagac cacgccgtgt ccatcgccgc gatcaacgga
2251 gcaacgtcga tcgtactgtc aggagatcac gacagcctcg aacaaatcgg
2301 cgagcacttc attacccaag atcgacgtac cacccgactg caggtcagtc
2351 acgctttcca ctctccacat atggacccca tcctcgaaca attccgccag
2401 atcgcggccc aactcacctt cagcgcaccc accctgccca tcttgtccaa
2451 cctcaccggg cagatcgccc gccacgacca actcgcctca cctgactatt
2501 ggacccaaca gctacgtaac actgtccggt tccatgacac tgtcgctgcc
2551 ctgctcgggg cgggtgagca ggttttcctg gaactttcac ctcacccggt
2601 gttgacacaa gcgatcaccg acaccgtcga acaagccggc ggcggcggcg
2651 cagcagtgcc agctctacgc aaggatcgcc ctgatgctgt cgcgttcgct
```

FIGURE 7

```
2701 gcagcactcg gccagctgca ctgccatggc atcagcccat cctggaatgt
2751 tctttactgc caggcccgcc ccctcacact gcccacctac gctttccagc
2801 atcagcgtta ctggctgctg cccaccgctg gtgatttcag cggggccaat
2851 acccacgcca tgcatccgct gctagacacc gccaccgaac tggccgaaaa
2901 ccgcggatgg gtgttcaccg gccggatcag cccacgcacc caaccatggc
2951 taaacgaaca cgccgtcgaa tcagccgtgc tgttcccagg caccggattt
3001 gtcgagctag cgctgcatgt cgctgaccgt gccggatatt cctcggtcaa
3051 cgaactgatc gtgcacaccc ccctgctact cgctggccac gacaccgcgg
3101 atctacagat caccgtcacc gacaccgatg acatgggccg gcagtctctt
3151 aacatccact cgcacccaca tatcggccat gacaacacca ccaccggcga
3201 tgaacaaccc gagtgggtcc tgcatgccag cgcagtcctg accgcacaaa
3251 ccaccgacca caaccacctc cccctaacgc ctgtgccgtg gcctccaccc
3301 ggcacagccg cgatcgaggt ggatgacttc tacgacgacc tggctgcaca
3351 gggctacaac tacggcccga cattccaagg tgtgcaacgg atatggcgtg
3401 accacgccac acccgatgtc atctacgccg aagttgaact acccgaagac
3451 accgacatcg acggctacgg catccacccc gccctattcg acgccgcttt
3501 acacccccta ctcgccctga cccaacccccc caccaacgac accgatgaca
3551 ccaacaccgc agacaccggt gaccaggtgc ggctgcccta cgcctttacc
3601 ggcatcagtt tgcacgccac ccacgccacc cgattgcggg tacggctgac
3651 ccgtaccggc gccgatgcca tcaccgtgca caccagtgac accaccggag
3701 cccccggtggc gatcatcgac tcattgatca cccgcccccct caccaccgcc
3751 acagggtctg ctccggcaac cacagcagct ggcctactac acctgagctg
3801 gccaccacac cctgacacca cgaccgacac cgacaccgac accgatgccc
3851 tgcggtatca ggtgatcgcc gaacccactc aacaactgcc ccgctacctg
3901 cacgacctac acaccagcac cgacctgcac accagcacca ccgaagcaga
3951 cgtggttgtg tggccggtac cggtgcccag caacgaagag ctccaggcac
4001 accaagcatc cgacaccgcg gtgtcttctc ggatacacac cctgacccgc
4051 caaacactta ccgtggtgca ggactggctc actcacccccg acaccaccgg
4101 cacccgactg gtcatcgtga cccgccacgg cgtcagcacc agtgcccacg
4151 acccggtccc cgacctagcc cacgccgcag tgtggggcct gatccgcagc
4201 gcccaaaacg aacaccccgg acgcttcaca ctgctcgaca ccgacgacaa
4251 caccaacagc gacaccctca ccaccgccct aaccctgcca acccgcgaaa
4301 accaactggc catacgccgc gacaccatcc acatcccccg cctgacccgc
4351 accgctgtcc tgacaccacc ggacagcggc ccctggcgcc ttgacaccac
4401 cggcaagggt gatctggcca acctcgccct gctaccgacc gcccacactg
4451 ccctggcctc tggacaaatc cgtatcgatg tccgggccgc tggtttgaat
4501 tttcacgacg tggtcgtcgc gttggggcta atccccgacg acggattcgg
4551 cggagaagcc gccggggtga tcagcgagat cggtcccgac gtctacggat
4601 tcgccgtggg tgatgccgtg accggcatga ccgtctctgg tgcgtttgcc
4651 cccagcactg tcgctgatca ccgcatggtg atgacgatcc cggcccggtg
4701 gtccttcccc caagccgcat ccataccggt ggtattcctg accgcctaca
4751 tcgctttggc cgagatctcg ggcctaagcc gagggcaacg agtgctgatc
4801 catgccggca ctggcggtgt gggtatggct gcgattcaat tggcacacca
4851 tttgggtgcc gaagtattcg ccaccgccag cgccgcgaaa tggagcaccc
4901 ttgaggcact gggggtaccg cgcgaccata tcgcttcctc gcgtactctg
4951 gacttttcca acgcattcct cgatgccacc aacggcgccg gtgttgatgt
5001 cgtattgaac tgcctcagtg gtgaattcgt cgaagcatcc ctagccctgc
5051 tgccccgcgg tggccatttc gtcgaaatcg gcaaaaccga catccgtgat
5101 accgaggtca tcgccgcaac ccatcccggc gtcatttacc gcgccctcga
5151 tctgctcagc gtctccccg atcacatcca gcgcacactg gcccaactgt
5201 ccccactgtt tgccaccgac accctaaaac ccctaccgac cactaattac
5251 agcatctacc aagccatctc ggccttacgt gacatgagtc aagcccgtca
5301 cacaggcaag atcgtgctca ctgcgccggt ggtggtagat cctgagggca
5351 cggtgttgat caccgggggg accgggacgc tgggtgcctt gttcgccgag
5401 catctggttt ctgcccatgg tgtccggcat ctgttgttga cctcgcggcg
5451 cggacctcag gcccacggtg ccaccgatct gcagcagcgg ctcaccgatc
5501 taggtgctca tgtcaccatc acggcctgcg atatcagcga ccccgaagca
```

FIGURE 7(continued)

```
5551 ctggccgccc tggtcaattc agtgcccaca caacaccgtt taaccgcggt
5601 agtgcacacc gccgcggtat tggccgacac cccggtcacc gagttgaccg
5651 gcgatcaact cgaccaggtg ctggccccca aaatcgacgc ggcatggcag
5701 ctgcaccaac tcacctacga acacaacctg tctgcattca tcatgttctc
5751 gtccatggcc ggaatgatag gcagtcccgg tcagggtaac tacgcggcag
5801 ccaacaccgc gttagatgct ctcgccgact accgccaccg cctgggcttg
5851 cccgcgacca gcctggcctg gggctactgg cagacccgca ccggtgtcac
5901 cgcgcatcta accgatgtag atctagcccg catgacccgc ctgggtttga
5951 tgcccatcgc caccagccac ggactggccc tgttcgatgc cgccctcgcc
6001 accggacagc ccgtttcgat acccgccccg atcaacaccc acccctggc
6051 ccgacacgcc cgcgacaaca ccctgacccc gatcctgtct gcgctgatca
6101 ccacaccacg gcgccgggcg gcctctgccg caaccgatct cgctgcccgc
6151 ctcaacggac ttagccccca acagcaacaa caaacactgg ccaccctcgt
6201 ggccgcggcc accgccaccg tgctgggcca ccacaccccc gaaagcatca
6251 gcccagccac cgcgttcaaa gacctcggaa tcgattcgct gaccgccctt
6301 gaactgcgca acaccctcac ccacaacacc ggcctggatc tgcccccccac
6351 cctcatcttc gatcacccca caccccatgc gctaacccaa cacctgcaca
6401 cccgactcac ccaaagccat accccggtcg gaccaattgc gtccctgcta
6451 agccacgcga tcgatgaggg caaattccgt gccggcgctg acctattgat
6501 ggccgcatcc aatttgaacc aaagtttcag caatatggct gaactcaacc
6551 agctcccggc cgtgacggac atagctgacg cgtctcctga tgggctactc
6601 accctgatct gcatctctac ctcagagaat gagtacgctc gcctcgctgc
6651 tgcgaacatt cattcactga ccttcgctga aattgcggcg cccggctttt
6701 acgacgcgca gctgccaaat tcgatagaga cgtcggcaga ggcgctggca
6751 actgccatca caggcgccta cgcaaatacg tccattgttc tggtagcgca
6801 ctccattgtc tgcgagctag ctcaggcaac gatgacacgc tacaagacg
6851 ctgacatcga tcttgtgggt ctggttctgt tggatccact cgaagggact
6901 aacagcactg aagattatgt ggagacagtc ttgactcgaa tcgagcatat
6951 caatgcaccg agggtcggag tagacggtta ccttgccgcc ctgggccgct
7001 atctccaatt ccacgaagac cgccgaatac caataccgga aacgcggcac
7051 atgacactgc actcggacac gaaaattgac cgtgcccaaa caccaatgaa
7101 cttattacaa gatgaggcag cgttgaccgc cctcaaaata ggaaactgga
7151 tgaacgacac agggagtatc gcagtaacac tgagagatgg acccgtattc
7201 ttgggcaggg cccgctctgt caacatgagg tga
```

FIGURE 7(continued)

MlsB gene
```
1     gtgatcttcg gagatgctca ccaaaactgc aggggaggtc gggtgttggg
51    tgatgcagtc gcagtggtcg gaatgtcttg ccggggttcct ggcgcatctg
101   atccggacgc tctgtgggcg ctgctgcgag acgggatcag tgtggtcgat
151   gagatacctt ctgcacgttg gaatttagac ggcctcgttg ctcaccgact
201   gaccgatgag caacgatcag cgcttcggca tggcgccttt cttgatgacg
251   tcgaagggtt tgacgccgcg ttcttcggaa ttaaccccctc cgaagctggg
301   tcgatggatc cgcagcaacg attgatgctt gaactgacct gggcagcact
351   cgaagatgct cgaatcgtgc cagaacatct ttccggtagc agtagcgggg
401   tgtttaccgg cgccatgagc gatgattaca cgaccgcggt gacctaccgc
451   gcagcgatga ctgcacatac ctttgcgggg actcaccgca gcctcatagc
501   caaccgtgtc tcctacacac tcggtctacg cggacctagt ttggtcatcg
551   ataccgggca atcgtcctca ctggtggctg tgcacgtggc aatggaaagc
601   ttgcgcagag aagaaacttc acttgctatc gcgggtggta ttcaccttaa
651   cctcagcctc gccgccgcac tgagcgcagc acactttgga gcccttttcac
701   ctgacggacg ctgctacacc ttcgacgcac gtgccaacrg atacgttcgt
751   ggcgaaggcg gcggcgtcgt cgtcctcaaa cgtctcaacg acgccctagc
801   cgacggcaac catatttact gtgtgatccg cggcagctca gtcaacaacg
851   acggcgccac tcaagacttg acagcgcccg gagtcgacgg ccagcgtcaa
901   gcgctccttc aagcttatga gcgagccgaa atcgacccct cagaagtcca
951   atacgtcgag ctacatggca ccggcacccg actcggcgat cccaccgaag
1001  cccactcgct tcactccgtc ttcggcacat ccacggtccc gcgcagcccg
1051  ctgctagtcg ggtcaatcaa aaccaatatc ggtcacctcg aaggcgccgc
1101  aggaatcctc ggcctaatca agactgccct tgccgttcat catcgccagc
1151  ttccccccag cctcaactac acggttccta acccaaaaat cccgctagag
1201  cagctagggc tccgcgtcca aaccactctc agtgaatggc cggacttaga
1251  caaaccgcta acggcgggcg tgtcatcttt ttccatgggt ggcaccaacg
1301  cccacctcat cctccaacaa ccccccaccc cgacaccac acaaacccccc
1351  aaccccacaa caggttctga tcccgcagtg ggttctgatc ccgcagtggg
1401  tgtactggtg tggccgttgt cagcgcgttc agcgccgggg ttaagcgcac
1451  aagcggcccg tctgtaccag catctcagcg cccacccccga tctggatccg
1501  atcgatgtag cccacagcct ggctaccaca cgcagccacc acccccaccg
1551  cgccaccatc accaccagca ttgagcacca cagcgaaaac aaccacgaca
1601  caaccgatgc gctggccgca ctgcacgccc tggccaacaa cggcacacac
1651  cccctgctga gcagaggcct gctgacccca cagggcccccg gcaaaacagt
1701  gttcgtgttc cccggacagg gcagtcaata ccccggcatg ggcgcagatc
1751  tctaccgcca attccccgtg ttcgcccacg ccctcgacga ggtcgctgcg
1801  gcgctgaacc cgcatctcga tgttgcgttg cttgaggtga tgttcagcca
1851  acaagacact gccatggcgc aactgctgga ccagaccttc tatgcacaac
1901  cggcgttgtt cgcgctggga accgctctac atcgattgtt cacccacgcc
1951  ggtatccacc cggactacct gctaggccac tccatcggag aactcaccgc
2001  ggcatacgcc gccggtgtgc tgtcactgca agacgcagcc accttggtca
2051  caagccgagg acgactgatg caatcctgca cgcccggcgg gacgatgctc
2101  gcactacaag ccagcgaagc agaagtacaa ccgctgcttg aaggcctaga
2151  ccacgccgtg tccatcgccg cgatcaacgg agcaacgtcg atcgtactgt
2201  caggagatca cgacagcctc gaacaaatcg gcgagcactt cattacccaa
2251  gatcgacgta ccacccgact gcaggtcagt cacgctttcc actctccaca
2301  tatggacccc atcctcgaac aattccgcca gatcgcggcc caactcacct
2351  tcagcgcacc caccctgccc atcttgtcca acctcaccgg gcagatcgcc
2401  cgccacgacc aactcgcctc acctgactat ggacccaac agctacgtaa
2451  cactgtccgg ttccatgaca ctgtcgctgc cctgctcggg gcgggtgagc
2501  aggttttcct ggaactttca cctcacccgg tgttgacaca agcgatcacc
2551  gacaccgtcg aacaagccgg cggcggcggc gcagcagtgc cagctctacg
2601  caaggatcgc cctgatgctg tcgcgttcgc tgcagcactc ggccagctgc
2651  actgccatgg catcagccca tcctggaatg ttctttactg ccaggcccgc
2701  cccctcacac tgcccaccta cgctttccag catcagcgtt actggctgct
2751  gcccaccgct ggtgatttca gcggggccaa tacccacgcc atgcatccgc
```

FIGURE 8

```
2801 tgctagacac cgccaccgaa ctggccgaaa accgcggatg ggtgttcacc
2851 ggccggatca gcccacgcac ccaaccatgg ctaaacgaac acgccgtcga
2901 atcagccgtg ctgttcccga acaccggatt tgtcgagcta gcgctgcatg
2951 tcgctgaccg tgccggatat tcctcggtca acgaactgat cgtgcacacc
3001 cccctgctgc tcgctggcca cgacaccgcg gatctacaga tcaccgtcac
3051 cgacaccgat gacatgggcc ggcagtctct taacatccac tcgcacccac
3101 atatcggcca tgacaacacc accaccggcg atgaacaacc cgagtgggtc
3151 ctgcatgcca gcgcagtcct gaccgcacaa accaccgacc acaaccacct
3201 cccccctaacg cctgtgccgt ggcctccacc cggcacagcc gcgatcgagg
3251 tggatgactt ctacgacgac ctggctgcac agggctacaa ctacggcccg
3301 acattccaag gtgtgcaacg gatatggcgt gaccacgcca cacccgatgt
3351 catctacgcc gaagttgaac taccocgaaga caccgacatc gacggctacg
3401 gcatccaccc cgccctattc gacgccgctt tacccccct actcgccctg
3451 acccaacccc ccaccaacga caccgatgac accaacaccg cagacaccgg
3501 ggaccaggtg cggctgccct acgcctttac cggcatcagt ttgcacgcca
3551 cccacgccac ccgattgcgg gtacggctga cccgtaccgg cgccgatgcc
3601 atcaccgtgc acaccagtga caccaccgga gccccggtgg cgatcatcga
3651 ctcattgatc acccgccccc tcaccaccgc cacagggtct gctccggcaa
3701 ccacagcagc tggcctacta cacctgagct ggccaccaca ccctgacacc
3751 acgaccgaca ccgacaccga caccgatgcc ctgcggtatc aggtgatcgc
3801 cgaacccact caacaactgc cccgctacct gcacgaccta cacaccagca
3851 ccgacctgca caccagcacc accgaagcag acgtggttgt gtggccggta
3901 ccggtgccca gcaacgaaga gctccaggca caccaagcat ccgacaccgc
3951 ggtgtcttct cggatacaca ccctgacccg ccaaacactt accgtggtgc
4001 aggactggct cactcacccc gacaccaccg gcacccgact ggtcatcgtg
4051 accgccacg gcgtcagcac cagtgcccac gacccggtcc ccgacctagc
4101 ccacgccgca gtgtgggggcc tgatccgcag cgcccaaaac gaacaccccg
4151 gacgcttcac actgctcgac accgacgaca acaccaacag cgacaccctc
4201 accaccgccc taaccctgcc aacccgcgaa aaccaactgg ccatacgccg
4251 cgacaccatc cacatccccc gcctgacccg acacagcagt gacggtgcgc
4301 tcactgcgcc ggtggtggta gatcctgagg gcacggtgtt gatcaccggg
4351 gggaccggga cgctgggtgc cttgttcgcc gagcatctgg tttctgccca
4401 tggtgtccgg catctgttgt tgacctcgcg gcgcggacct caggcccacg
4451 gtgccaccga tctgcagcag cggctcaccg atctaggtgc tcatgtcacc
4501 atcacggcct gcgatatcag cgaccccgaa gcactggccg ccctggtcaa
4551 ttcagtgccc acacaacacc gtttaaccgc ggtagtgcac accgccgcgg
4601 tattggccga caccccggtc accgagttga ccggcgatca actcgaccag
4651 gtgctggccc ccaaaatcga cgcggcatgg cagctgcacc aactcaccta
4701 cgaacacaac ctgtctgcat tcatcatgtt ctcgtccatg gccggaatga
4751 taggcagtcc cggtcagggt aactacgcgg cagccaacac cgcgttagat
4801 gctctcgccg actaccgcca ccgcctgggc ttgcccgcga ccagcctggc
4851 ctggggctac tggcagactc acaccggtct caccgcgcat ctaaccgatg
4901 tagatctagc ccgcatgacc cgcctgggtt tgatgcccat cgccaccagc
4951 cacggactgg ccctgttcga tgccgccctc gccaccggac agcccgtttc
5001 gataccgcc ccgatcaaca cccacaccct ggcccgacac gcccgcgaca
5051 acaccctggc cccgatcctg tctgcgctga tcaccacacc acggcgccgg
5101 gcggcctctg ccgcaaccga tctcgctgcc cgcctcaacg gacttagccc
5151 ccaacagcaa caacaaacac tggccacccct cgtggccgcg gccaccgcca
5201 ccgtgctggg ccaccacacc cccgaaagca tcagcccagc caccgcgttc
5251 aaagacctcg gaatcgattc gctgaccgcc cttgaactgc gcaacaccct
5301 cacccacaac accggcctca accttcgtc cactcttatc ttcgatcacc
5351 ccacacccca tgcggtggcc gagcatctgc ttgaacagat ccctggcatc
5401 ggtgccctgg tgccggctcc ggtggtgatc gcagctggtc gtaccgagga
5451 gccggtggcg gtggtgggga tggcgtgtcg tttccccggt ggtgtcgcat
5501 cagcggatca gttgtgggac ttggtgatcg ctggccgtga tgtggtgggt
5551 aattttccgg ccgatcgggg ttgggatgtg gagggactgt ttgatcccga
5601 tccggacgcg gtcggcaaaa cctacacccg ttacggcgcg ttccttgacg
```

FIGURE 8(continued)

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5651 atgcggcagg ttttgatgcc gggttctttg ggatctctcc acgggaggca
5701 cgcgcgatgg accccccagca gcggctgctg ctggaggtgt gctgggaagc
5751 gctagaaacc gcgggtattc ccgcgcacac cttggccggc acctccaccg
5801 gggtattcgt cggagcctgg gcccagtcct acggcgccac caactccgat
5851 gacgctgagg ggtatgcgat daccggcggc gcgactagcg tcatgtccgg
5901 ccgtatcgcc tacaccttgg gcctagaagg tccagcgatc accgttgaca
5951 ccgcctgctc gtcatcgctg gtggcaattc acctggcctg ccaatcctta
6001 cgcaacaacg aatcccagct agcactggcc ggcggcgtca ccgtgatgag
6051 cacacctgcg gttttcaccg agttctcccg ccaacgcggc ctggccccag
6101 atggacgctg caaagccttc gccgctaccg ccgatggcac cggctggggt
6151 gaaggcgccg cggtcttggt ccttgaacgg ctctccgagg cccgccgcaa
6201 caaccacccg gtccttgcga tcgtcgctgg atcggcgatc aaccaagacg
6251 gcgcatccaa cggactgacc gcaccccacg gcccgtcaca caacgcgtc
6301 atcaaccaag cactagccaa cgccggcctc acccacgacc aggtcgacgc
6351 cgtcgaagcc cacggcaccg gcaccacact gggtgacccc atcgaagcca
6401 gcgccctaca cgccacctac ggccaccacc acacgcccga tcaaccgctt
6451 tggctgggat ccatcaaatc caacatcggc cacacccaag ccgccgccgg
6501 cgccgccggt gtggtcaaga tgatccaagc catcacccac gccaccttgc
6551 ccgccacctt gcacgtcgac caacccagcc cccacatcga ctggtccagc
6601 ggcacagtcc gactcctaac cgagcccatc caatggccca acaccgacca
6651 cccccgcacc gcggcggtgt cctcattcgg catcagcggc accaacgccc
6701 acctcatcct ccaacaaccc cccacccta accccacaca aaccccgag
6751 gactgcagcc ccgcacaatc tccctgcgca acaatcaccg atgcaggcac
6801 gggattatcg tttgtgccct gggtgatttc agcgaagtcg gctgaggcgt
6851 tgtctgcgca ggcgagccga ttgttgacgc gccttgacga tgatccagtt
6901 gtcgatgcaa tcgacctggg gtggtcattg atagccactc gatcgatgtt
6951 tgagcatcgc gcagtagttg tgggtgcgga tcgtcaccag ttgcagcgcg
7001 ggttggccga gttggcttct ggtaacttgg gcgccgatgt agtggtgggc
7051 cgggcccgcg cagcgggcga gactgtaatg gtgtttcccg gtcagggatc
7101 acagcggttg ggcatgggcg cgcagcttta tgaacaattc ccggtattcg
7151 cggcggcgtt tgatgacgtt gttgatgcgc tggaccagta tctgtcggttg
7201 ccgctacgcc aagttatgtg gggtgacgat gaaggcctgc tcaattcaac
7251 ggagttcgcc cagccgtcgt tgtttgctgt cgaggtcgca ctgtttgcgt
7301 tgctgcgctt ctggggtgtc gttccggatt acgtgatagg ccattcggta
7351 ggagagctgg ccgctgcaca agtggctggc gttttgagcc tgcaggacgc
7401 ggctaaatta gtttcagcgc ggggccgact gatgcaggcc ctgcccgccg
7451 gtggagcgat ggtcgcggta gccgccagcc agcatgaagt cgagcctttg
7501 ctggttgaag gggtcgatat cgcggcgctc aatgcgccag ggtcagttgt
7551 gatctctggt gatcaggcgg cagtccgttt gatcgctaat cgattggcgg
7601 atagggcta cagggcgcac gaacttgcgg tttcgcatgc ctttcattca
7651 tcgttgatgg agccgatgtt ggaggagttc gctcggctcg cttctgaaat
7701 cgttgtggag caaccgcaga ttccactgat ttcgaacgtg actggtcagc
7751 tggccaacgc cgactacggg tcggcaggtt actgggtgga ccacatccgc
7801 cgtccagtcc gtttcgccga tagtgtcgct tcgttggaag ccatggggggc
7851 tagctgcttc attgaagtcg gtccagccag cgggttgggc gcagctatcg
7901 agcaatcctt gaaatctgcc gagccgaccg tgtcagtgtc ggcactgtcc
7951 accgataaac ctgaatccgt cgccgtattg cgcgctgcag cacgactttc
8001 cacctccggc attcctgtgg attggcagtc ggtgttcgac ggccgcagca
8051 cccagacagt taacctgccc acctacgcct tccagcggca acggttctgg
8101 ctcgacgcca accgtatcgg tcaaggcgat cccgccagtc aaccacaggc
8151 ccagaacgtt gaatcccgtt tttgggaggc ggtcgagcgg gaagacgttg
8201 atggcttggc tgattctata ggtgtcaccg ccagtgccat gcagaccgtg
8251 ctacctgcat tgtcttcatg gcgtcgcgcg gagcgcacac agtccgagct
8301 tgattcctgg cgctatcagg tgacatggct gtcttcccca gcaacgccga
8351 gttcgatcac gctgtccggc atttggttgc tgatagttcc aagcgaactt
8401 gcaaagactg acccagtaat tggatgtgct gcagcgctcg aagcgcacgg
8451 cgccttagtc acgattatca caattttcga gccggacttc aatcgctcat
```

FIGURE 8(continued)

```
8501   tgatgggcgc ttccctaaaa gatatcggtt cacacatatc tggtgtcata
8551   tcgttcttag ggattcacgg gtccgaattc tccgatagcg gcgcggtcaa
8601   gacattaaat cttgtgcaag caatgggcga tgtccactta gacgttcctt
8651   tgtggtgcct aacgcagggc gcggtatcga tcagcgccga cgatttgatc
8701   cgatgctcgt cagcagccct ggtgtggggt ctggggagag tcgtcgcatt
8751   agagcacccg ggatcgtggg gtggcttagt agacctcccc gagtcacccg
8801   acgatgcagc atgggagcgc ttgtgcgccc tcctcgcgca gccgacggat
8851   gaagatcagt ttgcgatcag gccgtctggg gttttcctac ggagattgat
8901   ccacgccccg gcaaccacga catccaaatc ctcgaccgcg tgggctccga
8951   gggggaccgt gttaatcaca ggcggcacag gcgcgttagg cgcacacgtc
9001   gcaaggtggt tggcccacaa atatgaatcg gtagatttgc tcttaaccag
9051   ccgtcgcggg atggcagccg atggagctac agagctagtg gatgacctcc
9101   gcacggctgg cgccagtgtg acagtgcacg cctgcgacgt gacagaccgc
9151   acttcagtcg aggctgcaat agcaggtaaa tcccttgatg cggtctttca
9201   tcttgcagga cgacaccagc caactctgct aacagaactc gaggacgaat
9251   cctttagtga cgaattggcg ccgaaggttc acggtgccca agtattgagt
9301   gacatcacgt ctaacctcac actatcagcg tttgtcatgt tctcgtcagt
9351   agccggaatc tggggcggca aaagtcaagg cgcatatgct gccgctaacg
9401   cattcttaga ttcgctcgcc gagaaacggc gcacgttggg gttaccagca
9451   acatcggtcg cttggggact gtgggctggc ggcggcatgg gagaccggcc
9501   atccgcttcg ggactaaacc ttattggctt gaaatcgatg tcagcagatt
9551   tagctgtgca ggcgctaagc gacgccattg acagaccgca agcaacattg
9601   actgttgcga gcgtcaactg ggatcggttc taccccacat tcgctttggc
9651   gcgaccgagg cccttcctac acgaaatcac agaggtaatg gcttaccgcg
9701   agtcgatgcg ctcaagctct gcatcgacgg cgacgctcct gacgagcaaa
9751   ttagccggac taacggcgac agaacagcgt gcagtcaccc ggaagttggt
9801   ccttgatcaa gccgcatccg ttctcgggta cgcctcaact gagagtctcg
9851   atactcatga gtcattcaaa gacctcggat ttgattcgct gaccgccctt
9901   gaactgcgcg accacctcca aactgcgacc ggcctcaacc tttcgtccac
9951   tcttatcttc gatcacccca caccccatgc ggtggccgag catctgcttg
10001  aacagatccc tggcatcggt gccctggtgc cggctccggt ggtgatcgca
10051  gctggtcgta ccgaggagcc ggtggcggtg gtggggatgg cgtgtcgttt
10101  ccccggtggt gtcgcatcag cggatcagtt gtgggacttg gtgatcgctg
10151  gccgtgatgt ggtgggtaat tttccggccg atcggggttg ggatgtggag
10201  ggactgtttg atcccgatcc ggacgcggtc ggcaaaacct acaccgtta
10251  cggcgcgttc cttgacgatg cggcaggttt tgatgccggg ttctttggga
10301  tctctccacg ggaggcacgc gcgatggacc cccagcagcg gctgctgctg
10351  gaggtgtgct gggaagcgct agaaaccgcg ggtattcccg cgcacacctt
10401  ggccggcacc tccaccgggg tattcgtcgg agcctgggcc cagtcctacg
10451  gcgccaccaa ctccgatgac gctgaggggt atgcgatgac cggcggcgcg
10501  actagcgtca tgtccggccg tatcgcctac accttgggcc tagaaggtcc
10551  agcgatcacc gttgacaccg cctgctcgtc atcgctggtg gcaattcacc
10601  tggcctgcca atccttacgc aacaacgaat cccagctagc actggccggc
10651  ggcgtcaccg tgatgagcac acctgcggtt ttcaccgagt tctcccgcca
10701  acgcggcctg gccccagatg gacgctgcaa agccttcgcc gctaccgccg
10751  atggcaccgg ctggggtgaa ggcgccgcgg tcttggtcct tgaacggctc
10801  tccgaggccc gccgcaacaa ccacccggtc cttgcgatcg tcgctggatc
10851  ggcgatcaac caagacggcg catccaacgg actgaccgca ccccacggcc
10901  cgtcacaaca acgcgtcatc aaccaagcac tagccaacgc cggcctcacc
10951  cacgaccagg tcgacgccgt cgaagcccac ggcaccggca ccacactggg
11001  tgaccccatc gaagccagcg ccctacacgc cacctacggc caccaccaca
11051  cgcccgatca accgctttgg ctgggatcca tcaaatccaa catcggccac
11101  acccaagccg ccgccggcgc cgccggtgtg gtcaagatga tccaagccat
11151  cacccacgcc accttgcccg ccaccttgca cgtcgaccaa cccagccccc
11201  acatcgactg gtccagcggc acagtccgac tcctaaccga gcccatccaa
11251  tggcccaaca ccgaccaccc ccgcaccgcg gcggtgtcct cattcggcat
11301  cagcggcacc aacgcccacc tcatcctcca acaaccccccc accctaacc
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FIGURE 8(continued)

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11351 ccacacaaac ccccgaggac tgcagccccg cacaatctcc ctgcgcaaca
11401 atcaccgatg caggcacggg attatcgttt gtgccctggg tgatttcagc
11451 gaagtcggct gaggcgttgt ctgcgcaggc gagccgattg ttgacgcgcc
11501 ttgacgatga tccagttgtc gatgcaatcg acctggggtg gtcattgata
11551 gccactcgat cgatgtttga gcatcgcgca gtagttgtgg gtgcggatcg
11601 tcaccagttg cagcgcgggt tggccgagtt ggcttctggt aacttgggcg
11651 ccgatgtagt ggtgggccgg ccccgcgcag cggcgagac tgtaatggtg
11701 tttcccggtc agggatcaca gcggttgggc atgggcgcgc agctttatga
11751 acaattcccg gtattcgcgg cggcgtttga tgacgttgtt gatgcgctgg
11801 accagtatct gcggttgccg ctacgccaag ttatgtgggg tgacgatgaa
11851 ggcctgctca attcaacgga gttcgcccag ccgtcgttgt ttgctgtcga
11901 ggtcgcactg tttgcgttgc tgcgcttctg gggtgtcgtt ccggattacg
11951 tgataggcca ttcggtagga gagctggccg ctgcacaagt ggctggcgtt
12001 ttgagcctgc aggacgcggc taaattagtt tcagcgcggg gccgactgat
12051 gcaggccctg cccgccggtg gagcgatggt cgcggtagcc gccagccagc
12101 atgaagtcga gcctttgctg gttgaagggg tcgatatcgc ggcgctcaat
12151 gcgccagggt cagttgtgat ctctggtgat caggcggcag tccgtttgat
12201 cgctaatcga ttggcggata ggggctacag ggcgcacgaa cttgcggttt
12251 cgcatgcctt tcattcatcg ttgatggagc cgatgttgga ggagttcgct
12301 cggctcgctt ctgaaatcgt tgtggagcaa ccgcagattc cactgatttc
12351 gaacgtgact ggtcagctgg ccaacgccga ctacgggtcg gcaggttact
12401 gggtggacca catccgccgt ccagtccgtt tcgccgatag tgtcgcttcg
12451 ttggaagcca tgggggctag ctgcttcatt gaagtcggtc cagccagcgg
12501 gttgggcgca gctatcgagc aatccttgaa atctgccgag ccgaccgtgt
12551 cagtgtcggc actgtccacc gataaacctg aatccgtcgc cgtattgcgc
12601 gctgcagcac gactttccac ctccggcatt cctgtggatt ggcagtcggt
12651 gttcgacggc cgcagcaccc agacagttaa cctgcccacc tacgccttcc
12701 agcggcaacg gttctggctc gacgccaacc gtatcggtca aggcgatccc
12751 gccagtcaac cacaggccca gaacgttgaa tcccgttttt gggaggcggt
12801 cgagcgggaa gacgttgatg gcttggctga ttctataggt gtcaccgcca
12851 gtgccatgca gaccgtgcta cctgcattgt cttcatggcg tcgcgcggag
12901 cgcacacagt ccgagcttga ttcctggcgc tatcaggtga catggctgtc
12951 ttcccagca acgccgagtt cgatcacgct gtccggcatt tggttgctga
13001 tagttccaag cgaacttgca aagactgacc cagtaattgg atgtgctgca
13051 gcgctcgaag cgcacgacgc cttagtcacg attatcacaa ttttcgagcc
13101 ggacttcaat cgctcattga tgggcgcttc cctaaaagat atcggttcac
13151 acatatctgg tgtcatatcg ttcttaggga ttcacgggtc cgaattctcc
13201 gatagcggcg cggtcaagac attaaatctt gtgcaagcaa tgggcgatgt
13251 ccacttagac gttcctttgt ggtgcctaac gcagggcgcg gtatcgatca
13301 gcgccgacga tttgatccga tgctcgtcag cagccctggt gtggggtctg
13351 gggagagtcg tcgcattaga gcacccggga tcgtggggtg gcttagtaga
13401 cctccccgag tcacccgacg atgcagcatg ggagcgcttg tgcgccctcc
13451 tcgcgcagcc gacggatgaa gatcagtttg cgatcaggcc gtctgggtt
13501 ttcctacgga gattgatcca cgccccggca accacgacat ccaaatcctc
13551 gaccgcgtgg gctccgaggg ggaccgtgtt aatcacaggc ggcacaggcg
13601 cgttaggcgc acacgtcgca aggtggttgg cccacaaata tgaatcggta
13651 gatttgctct taaccagccg tcgcgggatg gcagccgatg gagctacaga
13701 gctagtggat gacctccgca cggctggcgc cagtgtgaca gtgcacgcct
13751 gcgacgtgac agaccgcact tcagtcgagg ctgcaatagc aggtaaatcc
13801 cttgatgcgg tctttcatct tgcaggacga caccagccaa ctctgctaac
13851 agaactcgag gacgaatcct ttagtgacga attggcgccg aaggttcacg
13901 gtgcccaagt attgagtgac atcacgtcta acctcacact atcagcgttt
13951 gtcatgttct cgtcagtagc cggaatctgg ggcggcaaaa gtcaaggcgc
14001 atatgctgcc gctaacgcat tcttagattc gctcgccgag aaacggcgca
14051 cgttggggtt accagcaaca tcggtcgctt ggggactgtg ggctggcggc
14101 ggcatgggag accggccatc cgcttcggga ctaaacctta ttggcttgaa
14151 atcgatgtca gcagatttag ctgtgcaggc gctaagcgac gccattgaca
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FIGURE 8(continued)

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14201 gaccgcaagc aacattgact gttgcgagcg tcaactggga tcggttctac
14251 cccacattcg ctttggcgcg accgaggccc ttcctacacg aaatcacaga
14301 ggtaatggct taccgcgagt cgatgcgctc gagctctgca tcgacggcga
14351 cgctcctgac gagcaaatta gccggactaa cggcgacaga acagcgtgca
14401 gtcacccgga agttggtcct tgatcaagcc gcatccgttc tcgggtacgc
14451 ctcaactgag agtctcgata ctcatgagtc attcaaagac ctcggatttg
14501 attcgctgac cgcccttgaa ctgcgcgacc acctccaaac tgcgaccggc
14551 ctcaaccttt cgtccactct tatcttcgat caccccacac cccatgcggt
14601 ggccgagcat ctgcttgaac agatccctgg catcggtgcc ctggtgccgg
14651 ctccggtggt gatcgcagct ggtcgtaccg aggagccggt ggcggtggtg
14701 gggatggcgt gtcgtttccc cggtggtgtc gcatcagcgg atcagttgtg
14751 ggacttggtg atcgctggcc gtgatgtggt gggtaatttt ccggccgatc
14801 ggggttggga tgtggaggga ctgtttgatc ccgatccgga cgcggtcggc
14851 aaaacctaca cccgttacgg cgcgttcctt gacgatgcgg caggttttga
14901 tgccgggttc tttgggatct ctccacggga ggcacgcgcg atggaccccc
14951 agcagcggct gctgctggag gtgtgctggg aagcgctaga aaccgcgggt
15001 attcccgcgc acaccttggc cggcacctcc accggggtat tcgtcggagc
15051 ctgggcccag tcctacggcg ccaccaactc cgatgacgct gaggggtatg
15101 cgatgaccgg cggcgcgatc agcgtcatgt ccggccgtat cgcctacacc
15151 ttgggcctag aaggtccagc gatcaccgtt gacaccgcct gctcgtcatc
15201 gctggtggca attcacctgg cctgccaatc cttacgcaac aacgaatccc
15251 agctagcact gaccggcggc gtcaccgtga tgagcacacc tgcgattttc
15301 accgagttct cccgccaacg cggcctggcc ccagatggac gctgcaaagc
15351 cttcgccgct accgccgatg gcaccggctg gggtgaaggc gccgcggtct
15401 tggtccttga acggctctcc gaggcccgcc gcaacaacca cccggtcctt
15451 gcgatcgtcg ctggatcggc gatcaaccaa gacggcgcat ccaacggact
15501 gaccgcaccc cacggcccgt cacaacaacg cgtcatcaac caagcactag
15551 ccaacgccgg cctcacccac gaccaggtcg acgccgtcga gcccacggc
15601 accggcacca cactgggtga ccccatcgaa gccagcgccc tacacgccac
15651 ctacggccac caccacacgc ccgatcaacc gctttggctg ggatccatca
15701 aatccaacat cggccacacc caagccgccg ccggcgccgc cggtgtggtc
15751 aagatgatcc aagccatcac ccacgccacc ttgcccgcca ccttgcacgt
15801 cgaccaaccc agcccccaca tcgactggtc cagcggcaca gtccgactcc
15851 taaccgagcc catccaatgg cccaacaccg accaccccg caccgcggcg
15901 gtgtcctcat tcggcatcag cggcaccaac gcccacctca tcctccaaca
15951 accccccacc cccgacacca cacaaacccc caacaccaca acaggttctg
16001 atcccgcagt gggttctgat cccgcagtgg gtgtactggt gtggccgttg
16051 tcagcgcgtt cagcgccggg gttaagcgca caagcggccc gtctgtacca
16101 gcatctcagc gcccaccccg atctggatcc gatcgatgta gcccacagcc
16151 tggctaccac acgcagccac caccccacc gcgccaccat caccaccagc
16201 attgagcacc acagcgaaaa caaccacgac acaaccgatg cgctggccgc
16251 actgcacgcc ctggccaaca acggcacaca ccccctgctg agcagaggcc
16301 tgctgacccc acagggcccc ggcaaaacag tgttcgtgtt ccccggacag
16351 ggcagtcaat accccggcat gggcgcagat ctctaccgcc aattccccgt
16401 gttcgcccac gccctcgacg catgcgacgc agcgttacag cctttcactg
16451 gatggtcggt gctagctgtg ttacacgacg aacccgaggc ccgtcgttg
16501 gagcgagtcg atgtggtcca gcctgtgttg ttctcggtga tggtgtcgtt
16551 agccgcactc tggcggtggg ccggaatcac ccccgatgca gtcatcggcc
16601 actcccaggg cgagatcgcc gcggcacatg tggccggagc cctgaccttg
16651 cccgaagcag ctgcggtagt ggctttgcgc agccgtgtct tgaccgacct
16701 ggccggtgcc ggtgccatgg cttcagtgct atcgcccgag gaaccactga
16751 cccagctgct ggcacggtgg gacggcaaga tcactgtcgc cgcagttaac
16801 ggccccgcta gcgctgtggt ctccggcgat accacagcga tcaccgaatt
16851 gctgattacc tgcgaacacg aaaacatcga cgctcgcgct atcccggtgg
16901 actaccctc tcattcccc tatatggaac acatccgcca tcagttcctc
16951 gacgagctac ccgagctgac accgcggcca tcaaccatcg cgatgtattc
17001 caccgtcgac ggcgaacctc acgacaccgc ctacgacacc accacaatga
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FIGURE 8(continued)

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17051 ccgcggacta ctggtaccgc aacatccgta acactgtccg gttccatgac
17101 actgtcgctg ccctgctcgg ggcgggtgag caggttttcc tggaactttc
17151 acctcacccg gtgttgacac aagcgatcac cgacaccgtc gaacaagccg
17201 gcggcggcgg cgcagcagtg ccagctctac gcaaggatcg ccctgatgct
17251 gtcgcgttcg ctgcagcact cggccagctg cactgccatg gcatcagccc
17301 atcctggaat gttctttact gccaggcccg ccccctcaca ctgcccacct
17351 acgctttcca gcatcagcgt tactggctgc tgcccaccgc tggtgatttc
17401 agcggggcca atacccacgc catgcatccg ctgctagaca ccgccaccga
17451 actggccgaa aaccgcggat gggtgttcac cggccggatc agcccacgca
17501 cccaaccatg gctaaacgaa cacgccgtcg aatcagccgt gctgttccca
17551 ggcaccggat ttgtcgagct agcgctgcat gtcgctgacc gtgccggata
17601 ttcctcggtc aacgaactga tcgtgcacac ccccctgctg ctcgctggcc
17651 acgacaccgc ggatctacag atcaccgtca ccgacaccga tgacatgggc
17701 cggcagtctc ttaacatcca ctcgcgccca catatcggcc atgacaacac
17751 caccaccggc gatgaacaac ccgagtgggt cctgcatgcc agcgcagtcc
17801 tgaccgcaca aaccaccgac cacaaccacc tcccctaac gcctgtgccg
17851 tggcctccac ccggcacagc cgcgatcgag gtggatgact tctacgacga
17901 cctggctgca cagggctaca actacggccc gacattccaa ggtgtgcaac
17951 ggatatggcg tgaccacgcc cacccgatg tcatctacgc cgaagttgaa
18001 ctacccgaag acaccgacat cgacggctac ggcatccacc ccgccctatt
18051 cgacgccgct ttcacccccc tactcgccct gacccaaccc cccaccaacg
18101 acaccgatga caccaacacc gcagacaccg gtgaccaggt gcggctgccc
18151 tacgccttta ccggcatcag tttgcacgcc acccacgcca cccgattacg
18201 ggtacggctg acccgtaccg gcgccgatgc catcaccgtg cacaccagtg
18251 acaccaccgg agccccggtg gcgatcatcg actcattgat cacccgcccc
18301 ctcaccaccg ccacagggtc tgctccggca accacagcag ctggcctact
18351 acacctgagc tggccaccac accctgacac cacgaccgac accgacaccg
18401 acaccgatgc cctgcggtat caggtgatcg ccgaacccac tcaacaactg
18451 ccccgctacc tgcacgacct acacaccagc accgacctgc acaccagcac
18501 caccgaagca gacgtggttg tgtggccggt accggtgccc agcaacgaag
18551 agctccaggc acaccaagca tccgacaccg cggtgtcttc tcggatacac
18601 accctgaccc gccaaacact taccgtggtg caggactggc tcactcaccc
18651 cgacaccacc ggcacccgac tggtcatcgt gacccgccac ggcgtcagca
18701 ccagtgccca cgacccggtc cccgacctag cccacgccgc agtgtggggc
18751 ctgatccgca gcgcccaaaa cgaacacccc ggacgcttca cactgctcga
18801 caccgacgac aacaccaaca gcgacaccct caccaccgcc ctaaccctgc
18851 caacccgcga aaaccaactg gccatacgcc gcgacaccat ccacatcccc
18901 cgcctgaccc gacacagcag tgacggtgcg ctcactgcgc cggtggtggt
18951 agatcctgag ggcacggtgt tgatcaccgg ggggaccggg acgctgggtg
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19101 gcggctcacc gatctaggtg ctcatgtcac catcacggcc tgcgatatca
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19201 cgtttaaccg cggtagtgca caccgccgcg gtattggccg acaccccggt
19251 caccgagttg accggcgatc aactcgacca ggtgctggcc cccaaaatcg
19301 acgcggcatg gcagctgcac caactcacct acgaacacaa cctgtctgca
19351 ttcatcatgt tctcgtccat ggccggaatg ataggcagtc ccggtcaggg
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19451 accgcctggg cttgcccgcg accagcctgg cctggggcta ctggcagact
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19651 acccacaccc tggcccgaca cgcccgcgac aacaccctgg ccccgatcct
19701 gtctcgctg atcaccacac cacggcgccg ggcggcctct gccgcaaccg
19751 atctcgctgc ccgcctcaac ggacttagcc cccaacagca acaacaaaca
19801 ctggccaccc tcgtggccgc ggccaccgcc accgtgctgg gccaccacac
19851 ccccgaaagc atcagcccag ccaccgcgtt caaagacctc ggaatcgatt
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FIGURE 8(continued)

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19901 cgctgaccgc ccttgaactg cgcaacaccc tcacccacaa caccggcctg
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20001 cgagcatctg cttgaacaga tccctggcat cggtgccctg gtgccggctc
20051 cggtggtgat cgcagctggt cgtaccgagg agccggtggc ggtggtgggg
20101 atggcgtgtc gtttccccgg tggtgtcgca tcagcggatc agttgtggga
20151 cttggtgatc gctggccgtg atgtggtggg taattttccg gccgatcggg
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20301 cgggttcttt gggatctctc cacgggaggc acgcgcgatg gaccccccagc
20351 agcggctgct gctggaggtg tgctgggaag cgctagaaac cgcgggtatt
20401 cccgcgcaca ccttggccgg cacctccacc ggggtattcg ccggagcctg
20451 ggcccagtcc tacggcgcca ccaactccga tgacgctgag gggtatgcga
20501 tgaccggcgg ctcgactagc gtcatgtccg gccgtatcgc ctacaccttg
20551 ggcctagaag gtccagcgat caccgttgac accgcctgct cgtcatcgct
20601 ggtggcaatt cacctggcct gccaatcctt acgcaacaac gaatcccagc
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20701 gagttctccc gccaacgcgg cctggcccca gatggacgct gcaaagcctt
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20851 atcgtcgctg gatcggcgat caaccaagac ggcgcatcca acggactgac
20901 cgcaccccac ggcccgtcac aacaacgcgt catcaaccaa gcactagcca
20951 acgccggcct cacccacgac caggtcgacg ccgtcgaagc ccacggcacc
21001 ggcaccacac tgggtgaccc catcgaagcc agcgccctac acgccaccta
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21251 ccgagcccat ccaatggccc aacaccgacc accccgcac cgcggcggtg
21301 tcctcattcg gcatcagcgg caccaacgcc cacctcatcc tccaacaacc
21351 ccccacccc gacaccacac aaacccccaa ccccacaaca ggttctgatc
21401 ccgcagtggg ttctgatccc gcagtgggtg tactggtgtg gccgttgtca
21451 gcgcgttcag cgccgggggtt aagcgcacaa gcggcccgtc tgtaccagca
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21751 agtcaatacc ccggcatggg cgcagatctc taccgccaat tccccgtgtt
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22101 atcctgcacg cccggcggga cgatgctcgc actacaagcc agcgaagcag
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22301 aggtcagtca cgctttccac tctccacata tggaccccat cctcgaacaa
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22601 gcggcggcgc agcagtgcca gctctacgca aggatcgccc tgatgctgtc
22651 gcgttcgctg cagcactcgg ccagctgcac tgccatggca tcagcccatc
22701 ctggaatgtt ctttactgcc aggcccgccc cctcacactg cccacctacg
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FIGURE 8(continued)

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22851 ggccgaaaac cgcggatggg tgttcaccgg ccggatcagc ccacgcaccc
22901 aaccatggct aaacgaacac gccgtcgaat cagccgtgct gttcccaggc
22951 accggatttg tcgagctagc gctgcatgtc gctgaccgtg ccggatattc
23001 ctcggtcaac gaactgatcg tgcacacccc cctgctgctc gctggccacg
23051 acaccgcgga tctacagatc accgtcaccg acaccgatga catgggccgg
23101 cagtctctta acatccactc gcgcccacat atcggccatg acaacaccac
23151 caccggcgat gaacaacccg agtgggtcct gcatgccagc gcagtcctga
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23251 cctccacccg gcacagccgc gatcgaggtg gatgacttct acgacgacct
23301 ggctgcacag ggctacaact acggcccgac attccaaggt gtgcaacgga
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23451 cgccgcttta caccccctac tcgccctgac ccaacccccc accaacgaca
23501 ccgatgacac caacaccgca gacaccggtg accaggtgcg gctgccctac
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23751 cctgagctgg ccaccacacc ctgacaccac gaccgacacc gacaccgaca
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23851 cgctacctgc acgacctaca caccagcacc gacctgcaca ccagcaccac
23901 cgaagcagac gtggttgtgt ggccggtacc ggtgcccagc aacgaagagc
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26501 acatcggcca cacccaagcc gccgccggcg ccgccggtgt ggtcaagatg
26551 atccaagcca tcacccacgc cacccttgccc gccaccttgc acgtcgacca
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27151 caatacccccg gcatgggcgc agatctctac cgccaattcc ccgtgttcgc
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FIGURE 8(continued)

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30001 accgcggtag tgcacaccgc cgcggtattg gccgacaccc cggtcaccga
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30851 tgatcgcagc tggtcgtacc gaggagccgg tggcggtggt ggggatggcg
30901 tgtcgtttcc ccggtggtgt cgcatcagcg gatcagttgt gggacttggt
30951 gatcgctggc cgtgatgtgg tgggtaattt tccggccgat cggggttggg
31001 atgtggaggg actgtttgat cccgatccgg acgcggtcgg caaaacctac
31051 acccgttacg gcgcgttcct tgacgatgcg gcaggttttg atgccgggtt
31101 ctttgggatc tctccacggg aggcacgcgc gatggaccee cagcagcggc
31151 tgctgctgga ggtgtgctgg gaagcgctag aaaccgcggg tattcccgcg
31201 cacaccttgg ccggcacctc caccggggta ttcgccggag cctgggccca
```

FIGURE 8(continued)

```
31251 gtcctacggc gccaccaact ccgatgacgc tgaggggtat gcgatgaccg
31301 gcggcgcgac tagcgtcatg tccggccgta tcgcctacac cttgggccta
31351 gaaggtccag cgatcaccgt tgacaccgcc tgctcgtcat cgctggtggc
31401 aattcacctg gcctgccaat ccttacgcaa caacgaatcc cagctagcac
31451 tggccggcgg cgtcaccgtg atgagcacac ctgcggtttt caccgagttc
31501 tcccgccaac gcggcctggc cccagatgga cgctgcaaag ccttcgccgc
31551 taccgccgat ggcaccggct ttggtgaagg cgccgcggtc ttggtccttg
31601 aacggctctc cgaggcccgc cgcaacaacc acccggtcct tgcgatcgtc
31651 gctggatcgg cgatcaacca agacggcgca tccaacggac tgaccgcacc
31701 ccacggcccg tcacaacaac gcgtcatcaa ccaagcacta gccaacgccg
31751 gcctcaccca cgaccaggtc gacgccgtcg aagcccacgg caccggcacc
31801 acactgggtg accccatcga agccagcgcc ctacacgcca cctacggcca
31851 ccaccacacg cccgatcaac cgctttggct gggatccatc aaatccaaca
31901 tcggccacac ccaagccgcc gccggcgccg ccggtgtggt caagatgatc
31951 caagccatca cccacgccac cttgcccgcc accttgcacg tcgaccaacc
32001 cagcccccac atcgactggt ccagcggcac agtccgactc ctaaccgagc
32051 ccatccaatg gcccaacacc gaccaccccc gcaccgcggc ggtgtcctca
32101 ttcggcatca gcggcaccaa cgcccacctc atcctccaac aaccccccac
32151 ccccgacacc acacaaaccc ccaacaccac aacaggttct gatcccgcag
32201 tgggttctga tcccgcagtg ggtgtactgg tgtggccgtt gtcagcgcgt
32251 tcagcgccgg ggttaagcgc acaagcggcc cgtctgtacc agcatctcag
32301 cgcccacccc gatctggatc cgatcgatgt agcccacagc ctggctacca
32351 cacgcagcca ccaccccac cgcgccacca tcaccaccag cattgagcac
32401 cacagcgaaa acaaccacga cacaaccgat gcgctggccg cactgcacgc
32451 cctggccaac aacggcacac accccctgct gagcagaggc ctgctgaccc
32501 cacagggccc cggcaaaaca gtgttcgtgt tccccggaca gggcagtcaa
32551 taccccggca tgggcgcaga tctctaccgc caattccccg tgttcgccca
32601 cgccctcgac gcatgcgacg cagcgttaca gcctttcact ggatggtcgg
32651 tgctagctgt gttacgacg gaacccgagg ccccgtcgtt ggagcgagtc
32701 gatgtggtcc agcctgtgtt gttctcggtg atggtgtcgt tagccgcact
32751 ctggcggtgg gccggaatca cccccgatgc agtcatcggc cactcccagg
32801 gcgagatcgc cgcggcacat gtggccggag ccctgacctt gcccgaagca
32851 gctgcggtag tggctttgcg cagccgtgtc ttgaccgacc tggccggtgc
32901 cggtgccatg gcttcagtgc tatcgcccga ggaaccactg acccagctgc
32951 tggcacggtg ggacggcaag atcactgtcg ccgcagttaa cggcccccgct
33001 agcgctgtgg tctccggcga taccacagcg atcaccgaat tgctgattac
33051 ctgcgaacac gaaaacatcg acgctcgcgc tatcccggtg gactacccct
33101 ctcattcccc ctatatggaa cacatccgcc atcagttcct cgacgagcta
33151 cccgagctga caccgcggcc atcaaccatc gcgatgtatt ccaccgtcga
33201 cggcgaacct cacgacaccg cctacgacac caccacaatg accgcggact
33251 actggttaccg caacatccgt aacactgtcc ggttccatga cactgtcgct
33301 gccctgctcg gggcggggtga gcaggttttc ctggaacttt cacctcaccc
33351 ggtgttgaca caagcgatca ccgacaccgt cgaacaagcc ggcggcggcg
33401 gcgcagcagt gccagctcta cgcaaggatc gccctgatgc tgtcgcgttc
33451 gctgcagcac tcggccagct gcactgccat ggcatcagcc catcctggaa
33501 tgttctttac tgccaggccc gccccctcac actgcccacc tacgctttcc
33551 agcatcagcg ttactggctg ctgcccaccg ctggtgattt cagcggggcc
33601 aatacccacg ccatgcatcc gctgctagac accgccaccg aactggccga
33651 aaaccgcgga tgggtgttca ccggccggat cagcccacgc acccaaccat
33701 ggctaaacga acacgccgtc gaatcagccg tgctgttccc aggcaccgga
33751 ttcgtcgagc tagcgctgca tgtcgctgac cgtgccggat attcctcggt
33801 caacgaactg atcgtgcaca cccccctgct actcgctggc cacgacaccg
33851 cggatctaca gatcaccgtc accgacaccg atgacatggg ccggcagtct
33901 cttaacatcc actcgcgccc acatatcggc catgacaaca ccaccaccgg
33951 cgatgaacaa cccgagtggg tcctgcatgc cagcgcagtc ctgaccgcac
34001 aaaccaccga ccacaaccac ctccccctaa cgcctgtgcc gtggcctcca
34051 cccggcacag ccgcgatcga ggtggatgac ttctacgacg acctggctgc
```

FIGURE 8(continued)

```
34101 acagggctac aactacggcc cgacattcca aggtgtgcaa cggatatggc
34151 gtgaccacgc cacacccgat gtcatctacg ccgaagttga actacccgaa
34201 gacaccgaca tcgacggcta cggcatccac cccgccctat tcgacgccgc
34251 tttacacccc ctactcgccc tgacccaacc ccccaccaac gacaccgatg
34301 acaccaacac cgcagacacc ggtgaccagg tgcggctgcc ctacgccttt
34351 accggcatca gtttgcacgc cacccacgcc acccgattac gggtacggct
34401 gacccgtacc ggcgccgatg ccatcaccgt gcacaccagt gacaccaccg
34451 gagccccggt ggcgatcatc gactcattga tcacccgccc cctcaccacc
34501 gccacagggt ctgctccggc aaccacagca gctggcctac tacacctgag
34551 ctggccacca caccctgaca ccacgaccga caccgacacc gacaccgatg
34601 ccctgcggta tcaggtgatc gccgaaccca ctcaacaact gccccgctac
34651 ctgcacgacc tacacaccag caccgacctg cacaccagca ccaccgaagc
34701 agacgtggtt gtgtggccgg taccggtgcc cagcaacgaa gagctccagg
34751 cacaccaagc atccgacacc gcggtgtctt ctcggataca caccctgacc
34801 cgccaaacac ttaccgtggt gcaggactgg ctcactcacc ccgacaccac
34851 cggcacccga ctggtcatcg tgacccgcca cggcgtcagc accagtgccc
34901 acgacccggt ccccgaccta gcccacgccg cagtgtgggg cctgatccgc
34951 agcgcccaaa acgaacaccc cggacgcttc acactgctcg acaccgacga
35001 caacaccaac agcgacaccc tcaccaccgc cctaaccctg ccaacccgcg
35051 aaaaccaact ggccatacgc cgcgacacca tccacatccc ccgcctgacc
35101 cgacacagca gtgacggtgc gctcactgcg ccggtggtgg tagatcctga
35151 gggcacggtg ttgatcaccg gggggaccgg gacgctgggt gccttgttcg
35201 ccgagcatct ggtttctgcc catggtgtcc ggcatctgtt gttgacctcg
35251 cggcgcggac ctcaggccca cggtgccacc gatctgcagc agcggctcac
35301 cgatctaggt gctcatgtca ccatcacggc ctgcgatatc agcgacccccg
35351 aagcactggc cgccctggtc aattcagtgc ccacacaaca ccgtttaacc
35401 gcggtagtgc acaccgccgc ggtattggcc gacaccccgg tcaccgagtt
35451 gaccggcgat caactcgacc aggtgctggc ccccaaaatc gacgcggcat
35501 ggcagctgca ccaactcacc tacgaacaca acctgtctgc attcatcatg
35551 ttctcgtcca tggccggaat gataggcagt cccggtcagg gtaactacgc
35601 ggcagccaac accgcgttag atgctctcgc cgactaccgc caccgcctgg
35651 gcttgcccgc gaccagcctg gcctggggct actggcagac tcacaccggt
35701 ctcaccgcgc atctaaccga tgtagatcta gcccgcatga cccgcctggg
35751 tttgatgccc atcgccacca gccacggact ggccctgttc gatgccgccc
35801 tcgccaccgg acagcccgtt tcgatacccg ccccgatcaa cacccacacc
35851 ctggccgac acgcccgcga caacaccctg gccccgatcc tgtctgcgct
35901 gatcaccaca ccacggcgcc gggcggcctc tgccgcaacc gatctcgctg
35951 cccgcctcaa cggacttagc ccccaacagc aacaacaaac actggcgcacc
36001 ctcgtggccg cggccaccgc caccgtgctg ggccaccaca cccccgaaag
36051 catcagccca gccaccgcgt tcaaagacct cggaatcgat tcgctgaccg
36101 cccttgaact gcgcaacacc ctcacccaca cacccggcct ggatctgccc
36151 cccaccctca tcttcgatca ccccacaccc catgcggtgg ccgagcatct
36201 gcttgaacag atccctggca tcggtgccct ggtgccggct ccggtggtga
36251 tcgcagctgg tcgtaccgag gagccggtgg cggtggtggg gatggcgtgt
36301 cgtttcccccg gtggtgtcgc atcagcggat cagttgtggg acttggtgat
36351 cgctggccgt gatgtggtgg gtaattttcc ggccgatcgg ggttgggatg
36401 tggagggact gtttgatccc gatccggacg cggtcggcaa aacctacacc
36451 cgttacggcg cgttccttga cgatgcggca ggttttgatg ccgggttctt
36501 tgggatctct ccacgggagg cacgcgcgat ggacccccag cagcggctgc
36551 tgctggaggt gtgctgggaa cgcgctagaaa ccgcgggtat tcccgcgcac
36601 accttggccg gcacctccac cggggtattc gccggagcct gggcccagtc
36651 ctacggcgcc accaactccg atgacgctga ggggtatgcg atgaccggcg
36701 gcgcgactag cgtcatgtcc ggccgtatcg cctacacctt gggcctagaa
36751 ggtccagcga tcaccgttga caccgcctgc tcgtcatcgc tggtggcaat
36801 tcacctggcc tgccaatcct tacgcaacaa cgaatcccag ctagcactgg
```

FIGURE 8(continued)

```
36851 ccggcggcgt caccgtgatg agcacacctg cggttttcac cgagttctcc
36901 cgccaacgcg gcctggcccc agatggacgc tgcaaagcct tcgccgctac
36951 cgccgatggc accggctttg gtgaaggcgc cgcggtcttg gtccttgaac
37001 ggctctccga ggcccgccgc aacaaccacc cggtccttgc gatcgtcgct
37051 ggatcggcga tcaaccaaga cggcgcatcc aacggactga ccgcacccca
37101 cggcccgtca caacaacgcg tcatcaacca agcactagcc aacgccggcc
37151 tcacccacga ccaggtcgac gccgtcgaag cccacggcac cggcaccaca
37201 ctgggtgacc ccatcgaagc cagcgcccta cacgccacct acggccacca
37251 ccacacgccc gatcaaccgc tttggctggg atccatcaaa tccaacatcg
37301 gccacaccca agccgccgcc ggcgccgccg gtgtggtcaa gatgatccaa
37351 gccatcaccc acgccacctt gcccgccacc ttgcacgtcg accaacccag
37401 cccccacatc gactggtcca gcggcacagt ccgactccta accgagccca
37451 tccaatggcc caacaccgac cacccccgca ccgcggcggt gtcctcattc
37501 ggcatcagcg gcaccaacgc ccacctcatc ctccaacaac cccccacccc
37551 cgacaccaca caaaccccca acaccacaac aggttctgat cccgcagtgg
37601 gttctgatcc cgcagtgggt gtactggtgt ggccgttgtc agcgcgttca
37651 gcgccggggt taagcgcaca agcggcccgt ctgtaccagc atctcagcgc
37701 ccaccccgat ctggatccga tcgatgtagc ccacagcctg gctaccacac
37751 gcagccacca ccccaccgc gccaccatca ccaccagcat tgagcaccac
37801 agcgaaaaca accacgacac aaccgatgcg ctggccgcac tgcacgccct
37851 ggccaacaac ggcacacacc ccctgctgag cagaggcctg ctgaccccac
37901 agggccccgg caaaacagtg ttcgtgttcc cggacaggg cagtcaatac
37951 cccggcatgg gcgcagatct ctaccgccaa ttccccgtgt tcgcccacgc
38001 cctcgacgag gtcgctgcgg cgctgaaccc gcatctcgat gttgcgttgc
38051 ttgaggtgat gttcagccaa caagacactg ccatggcgca actgctggac
38101 cagaccttct atgcacaacc ggcgttgttc gcgctgggaa ccgctctaca
38151 tcgattgttc acccacgccg gtatccaccc ggactacctg ctaggccact
38201 ccatcggaga actcaccgcg gcatacgccg ccggtgtgct gtcactgcaa
38251 gacgcagcca ccttggtcac aagccgagga cgactgatgc aatcctgcac
38301 gcccggcggg acgatgctcg cactacaagc cagcgaagca gaagtacaac
38351 cgctgcttga aggcctagac cacgccgtgt ccatcgccgc gatcaacgga
38401 gcaacgtcga tcgtactgtc aggagatcac gacagcctcg aacaaatcgg
38451 cgagcacttc attacccaag atcgacgtac cacccgactg caggtcagtc
38501 acgctttcca ctctccacat atggacccca tcctcgaaca attccgccag
38551 atcgcggccc aactcacctt cagcgcaccc accctgccca tcttgtccaa
38601 cctcaccggg cagatcgccc gccacgacca actcgcctca cctgactatt
38651 ggacccaaca gctacgtaac actgtccggt tccatgacac tgtcgctgcc
38701 ctgctcgggg cgggtgagca ggttttcctg gaactttcac ctcacccggt
38751 gttgacacaa gcgatcaccg acaccgtcga acaagccggc ggcggcggcg
38801 cagcagtgcc agctctacgc aaggatcgcc ctgatgctgt cgcgttcgct
38851 gcagcactcg gccagctgca ctgccatggc atcagcccat cctggaatgt
38901 tctttactgc caggcccgcc ccctcacact gcccacctac gctttccagc
38951 atcagcgtta ctggctgctg cccaccgctg gtgatttcag cggggccaat
39001 acccacgcca tgcatccgct gctagacacc gccaccgaac tggccgaaaa
39051 ccgcggatgg gtgttcaccg gccggatcag cccacgcacc caaccatggc
39101 taaacgaaca cgccgtcgaa tcagccgtgc tgttcccagg caccggattt
39151 gtcgagctag cgctgcatgt cgctgaccgt gccggatatt cctcggtcaa
39201 cgaactgatc gtgcacaccc ccctgctact cgctggccac gacaccgcgg
39251 atctacagat caccgtcacc gacaccgatg acatgggccg gcagtctctt
39301 aacatccact cgcgcccaca tatcggccat gacaacacca ccaccggcga
39351 tgaacaaccc gagtgggtcc tgcatgccag cgcagtcctg accgcacaaa
39401 ccaccgacca caaccacctc cccctaacgc ctgtgccgtg gcctccaccc
39451 ggcacagccg cgatcgaggt ggatgacttc tacgacgacc tggctgcaca
39501 gggctacaac tacggcccga cattccaagg tgtgcaacgg atatggcgtg
39551 accacgccac acccgatgtc atctacgccg aagttgaact acccgaagac
39601 accgacatcg acggctacgg catccacccc gccctattcg acgccgcttt
39651 acacccccta ctcgccctga cccaacccc caccaacgac accgatgaca
```

FIGURE 8(continued)

```
39701 ccaacaccgc agacaccggg gaccaggtgc ggctgcccta cgcctttacc
39751 ggcatcagtt tgcacgccac ccacgccacc cgattacggg tacggctgac
39801 ccgtaccggc gccgatgcca tcaccgtgca caccagtgac accaccggag
39851 ccccggtggc gatcatcgac tcattgatca cccgcccccct caccaccgcc
39901 acagggtctg ctccggcaac cacagcagct ggcctactac acctgagctg
39951 gccaccacac cctgacacca cgaccgacac cgacaccgac accgatgccc
40001 tgcggtatca ggtgatcgcc gaaccactc aacaactgcc ccgctacctg
40051 cacgacctac acaccagcac cgacctgcac accagcacca ccgaagcaga
40101 cgtggttgtg tggccggtac cggtgcccag caacgaagag ctccaggcac
40151 accaagcatc cgacaccgcg gtgtcttctc ggatacacac cctgacccgc
40201 caaacactta ccgtggtgca ggactggctc actcaccccg acaccaccgg
40251 cacccgactg gtcatcgtga cccgccacgg cgtcagcacc agtgcccacg
40301 acccggtccc cgacctagcc cacgccgcag tgtggggcct gatccgcagc
40351 gcccaaaacg aacaccccgg acgcttcaca ctgctcgaca ccgacgacaa
40401 caccaacagc gacaccctca ccaccgccct aaccctgcca acccgcgaaa
40451 accaactggc catacgccgc gacaccatcc acatcccccg cctgacccga
40501 cacagcagtg acggtgcgct cactcgcccg gtggtggtag atcctgaggg
40551 cacggtgttg atcaccgggg ggaccgggac gctgggtgcc ttgttcgccg
40601 agcatctggt ttctgcccat ggtgtccggc atctgttgtt gacctcgcgg
40651 cgcggacctc aggcccacgg tgccaccgat ctgcagcagc ggctcaccga
40701 tctaggtgct catgtcacca tcacggcctg cgatatcagc gaccccgaag
40751 cactggccgc cctggtcaat tcagtgccca cacaacaccg tttaaccgcg
40801 gtagtgcaca ccgccgcggt attggccgac accccggtca ccgagttgac
40851 cggcgatcaa ctcgaccagg tgctggcccc caaaatcgac gcggcatggc
40901 agctgcacca actcacctac gaacacaacc tgtctgcatt catcatgttc
40951 tcgtccatgg ccggaatgat aggcagtccc ggtcagggta actacgcggc
41001 agccaacacc gcgttagatg ctctcgccga ctaccgccac cgcctgggct
41051 tgcccgcgac cagcctggcc tggggctact ggcagactca caccggtctc
41101 accgcgcatc taaccgatgt agatctagcc cgcatgaccc gcctgggttt
41151 gatgcccatc gccaccagcc acggactggc cctgttcgat gccgccctcg
41201 ccaccggaca gcccgtttcg atacccgccc cgatcaacac ccacaccctg
41251 gcccgacacg cccgcgacaa caccctggcc ccgatcctgt ctgcgctgat
41301 caccacacca cggcgccggg cggcctctgc cgcaaccgat ctcgctgccc
41351 gcctcaacgg acttagcccc caacagcaac aacaaacact ggccacccctc
41401 gtggccgcgg ccaccgccac cgtgctgggc caccacaccc ccgaaagcat
41451 cagcccagcc accgcgttca aagacctcgg aatcgattcg ctgaccgccc
41501 ttgaactgcg caacaccctc acccacaaca ccggcctgga tctgcccccc
41551 accctcatct tcgatcaccc cacacccccat gcgctaaccc aacacctgca
41601 cacccgactc acccaaagcc ataccccggt cggaccaatt gcgtccctgc
41651 taagccacgc gatcgatgag ggcaaattcc gtgccggcgc tgacctattg
41701 atggccgcat ccaatttgaa ccaaagtttc agcaatatgg ctgaactcaa
41751 ccagctcccg gccgttgacg acatagctga cgcgtctcct gatgggctac
41801 tcaccctgat ctgcatctct acctcagaga atgatacgc tcgcctcgct
41851 gctgcgaaca ttcattcact gaccttcgct gaaattgcgg cgcccggctt
41901 ttacgacgcg cagctgccaa attcgataga dacgtcggca gaggcgctgg
41951 caactgccat cacaggcgcc tacgcaaata cgtccattgt tctggtagcg
42001 cactccattg tctgcgagct agctcaggca acgatgacac gtctacaaga
42051 cgctgacatc gatcttgtgg gtctggttct gttggatcca ctcgaaggga
42101 ctaacagcac tgaagattat gtggagacag tcttgactcg aatcgagcat
42151 atcaatgcac cgagggtcgg agtagacggt taccttgccg ccctgggccg
42201 ctatctccaa ttccacgaag accgccgaat accaataccg gaaacgcggc
42251 acatgacact gcactcggac acgaaaattg accgtgccca aacaccaatg
42301 aacttattac aagatgaggc agcgttgacc gccctcaaaa taggaaactg
42351 gatgaacgac gtgggtgttg ccctctctgt caaccttgag tga
```

FIGURE 8(continued)

Mup045 gene
```
1    gtgatttgga atgacatcta cataagtgga acggggcgtt tcatcccgtc
51   aatgcgacca attaatgata tccaggtcga cggtgttccg aatgatcata
101  ctatcgtgca atccgattac atttccttca ccgaagccga tgagccggct
151  acagtcatgg ccacgcgcgc tgcaaccgaa gcgctgacca cttccgagct
201  agtatccgct gatgttggcg tcttgatata tgccgcgatc atcggcgatg
251  cgcatcattt tgcccccgta tgtcacgtcc aaagagtcct ccgggcgccc
301  gatgcgctgg cattcgaact ttccgcagca agtaacggtg gaacacaagg
351  catcgcagtt gctgcaaatc tcatgacagc tgacgcgtcc gtgaaagctg
401  cactcgtttg tacagcttac cggcacccga tcgatattat cagccgttgg
451  tcgtcaggta tggtattcgg cgatggagca gccgccgccg tgctttcaag
501  agacggcgga atggtgcgat tgatttccgg gtatcacggc tcactgccgg
551  agctagaggt tcttgctaga aatcgatcca acgaacgact tggctttgtg
601  ctgccagacg tcgggttagg aaaataccta actgctatag cgcggatgta
651  ccaagcggta attgcgcaag tactagaaga ggcacaaact agtattgccg
701  agatcgacta tttcggcctg atcggtatag gaattccaag tctcacagcg
751  actatcttag aacccaacgg tattccagtt aataaaacat cctggggttt
801  gctaagacaa atgggccacg ttggagcttg cgatcccctg ctgagcctta
851  accacctatt cgagcagaat gtcctcaagc gcggcgacaa agtcctactc
901  ctaggtggcg gggtggggta tcgattgaca tgcattgtgg ctgaaatcgc
951  catgaatccc ggcgtgcccg gacactccac ttcgtag
```


FIGURE 9

Mup053 gene
```
1    gtgaggcaga gattgaactg gattgcggcg cacgggttgc tccgcggcac
51   cgcgcggtta gcggcccggc tgggcgacgt gcagtcgcgg ctggtggcag
101  atcccatggt tatggcaaac ccggcgccat tttgcgatga attgagggca
151  atcggccctg tggtgtcgag ctacggcacc cacctcgtcg ttagtcatgc
201  catcgcccat gaactgcttc ggtccgaaga cttcgaagtg gtctcgctcg
251  gatcgaactt gccggcacca atgcgctggc tagagcgccg cactcgggac
301  gatacgcccc atctgctgct gccgccgtcg ttgctggccg ttgagccgcc
351  gaatcacacg cgctatcgca aggcagtgtc ctcggtgttc acgccgaaag
401  cagtagccgg attacgcgat catgtcgaag agactgcgtc ggcgctgttg
451  gatcagctca ccgaccaggc tagtgccgtc gacatcatag cccgctactg
501  ctcccagctg ccggtcgcgg tcatttgtga catcttaggc gtgcccagtc
551  gagaccgaaa ccgtgttctc aagttcggtc agctggcggg gccctgcttg
601  gattttgggc tcacatggcg tcagcaccag caggtgcggc aagggctcca
651  aggactccac ttctggatca ccgagcacct cgaggaattg cggtctaacc
701  ccggtgacga tctgatgagt caaatgatcc acgcaagtga aaatggctcc
751  tcggaaacac acctccacgc aaccgaagtg cggatgatcg ggctggtgtt
801  gggcgccagt ttcgcaacaa cgatggacct gttaggcaac gggattcagg
851  tgttgttgga cgcgcccgaa ctgcgggacg cgttgagtca gcgcccgcaa
901  ctttggccca acgcggtaga agagatcctg cggttggagc caccggttca
951  gctcgccgga cgaatggctc gcaaggacac cgaggtggcg ggtaccgcaa
1001 tcaagcgggg ccagctggtg gcgatctatc tggggcggt caaccgtgat
1051 ccgtccgtgt tcgccgatcc gcaccgcttt gacatcacac gagccaacgc
1101 caaccggcat ctcgcattct ccggtggccg ccacttctgc ctcggtgccg
1151 cccttgcccg cgtcgaaggc gaagtcggat tgagaatgct cttcgagcgc
1201 ttccctgacg tgcgcgccgc aggccccgga aatagacgtg atactcgaac
1251 tctgcggggt tggtcgcagc tgccggtcca gttgggcgca gcacgatcga
1301 tggctatccg atga
```


FIGURE 10

Mup038 gene
```
1    atgattgttt ggcccgaagt ggtcagcaca gtggtcgacg tcgatggcgt
51   ggcgatgtcg gcactagtcg ccgaacccga tcaggagcct aaggccgtga
101  tcttagccct gcatggcggt gccaccaacg cgcggtattt cgactgccct
151  ggccaccgcg cgctttccct gctgcacacc ggcgcggcgg cgggattcac
201  cgttgtggcc cttgaccggc ccggctacgg cagctcggcg ggtgatcccg
251  acgcgatgaa ccggccccac cagcgggccg cgctggccta tggggcgctg
301  gatcgcatcc tggcgcagcg gccacgcggg gccggggtgt tcataatggg
351  ccattcaaac ggatgcgaac tggcgatgtg gatggccacc gagacgcgcg
401  gtgccgagct gctcggcatc gagttggctg gtaccggctg gcattatcag
451  cccgaggccc gagaaatcct gacaacggcc actggtgaac atcggtgggt
501  gggcctctat gatttgctct ggcatccgca gcggctatac ccgcccgagg
551  tcctcaacgc ggccatcatt tcttcgtccg ccccggccta cgaggagcag
601  atgatggccg actggacccg ccgaaccttc ctggagctag tccctgctgt
651  gcgtgtgccg gtacatttca gcatcgccca acacgaaaag gtttggcagc
701  gcgatagttc agcgctagat gaaatcgccg tcctgttctc tggcgcgccg
751  cggttcatcc tgcatgaaca acccgaggcc ggacacaaca tcagcctggg
801  ccacaccgcc ggcgactacc acacgacagt cctgtcgttt gtccagcaat
851  gtctggccga acggttggcc aacgcgcaac aagatgtcga tctcgcggcc
901  gagtga
```

FIGURE 11

MlsA1 protein
VIFGDAHQNCRGGRVLGDAVAVVGMSCRVPGASDPDALWALLRDGISVVDEIPSARWNLD
GLVAHRLTDEQRSALRHGAFLDDVEGFDAAFFGINPSEAGSMDPQQRLMLELTWAALEDA
RIVPEHLSGSSSGVFTGAMSDDYTTAVTYRAAMTAHTFAGTHRSLIANRVSYTLGLRGPS
LVIDTGQSSSLVAVHVAMESLRREETSLAIAGGIHLNLSLAAALSAAHFGALSPDGRCYT
FDARANGYVRGEGGGVVVLKRLNDALADGNHIYCVIRGSSVNNDGATQDLTAPGVDGQRQ
ALLQAYERAEIDPSEVQYVELHGTGTRLGDPTEAHSLHSVFGTSTVPRSPLLVGSIKTNI
GHLEGAAGILGLIKTALAVHHRQLPPSLNYTVPNPKIPLEQLGLRVQTTLSEWPDLDKPL
TAGVSSFSMGGTNAHLILQQPPTPDTTQTPNPTTGSDPAVGSDPAVGVLVWPLSARSAPG
LSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIEHHSENNHDTTDALAA
LHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLYRQFPVFAHALDEVAA
ALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQPALFALGTALHRLFTHAGIHPDYLLGH
SIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCTPGGTMLALQASEAEVQPLLEGLDHAV
SIAAINGATSIVLSGDHDSLEQIGEHFITQDRRTTRLQVSHAFHSPHMDPILEQFRQIAA
QLTFSAPTLPILSNLTGQIARHDQLASPDYWTQQLRNTVRFHDTVAALLGAGEQVFLELS
PHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHCHGISPSWNVLYCQAR
PLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENRGWVFTGRISPRTQPW.
LNEHAVESAVLFPNTGFVELALHVADRAGYSSVNELIVHTPLLLAGHDTADLQITVTDTD
DMGRQSLNIHSHPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHNHLPLTPVPWPPPGTA
AIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELPEDTDIDGYGIHPALF
DAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATHATRLRVRLTRTGADA
ITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWPPHPDTTTDTDTDTDA
LRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSNEELQAHQASDTAVSS
RIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPDLAHAAVWGLIRSAQN
EHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRLTRHSSDGALTAPVVV
DPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHGATDLQQRLTDLGAHVT
ITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELTGDQLDQVLAPKIDAAW
QLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALADYRHRLGLPATSLAWGY
WQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQPVSIPAPINTHTLARH
ARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTLATLVAAATATVLGHHT
PESISPATAFKDLGIDSLTALELRNTLTHNTGLNLSSTLIFDHPTPHAVAEHLLEQIPGI
GALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVIAGRDVVGNFPADRGWDV
EGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAMDPQQRLLLEVCWEALET
AGIPAHTLAGTSTGVFVGAWAQSYGATNSDDAEGYAMTGGATSVMSGRIAYTLGLEGPAI
TVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFTDFSRQRGLAPDGRCKAF
AATADGTGWGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQDGASNGLTAPHGPSQQRV
INQALANAGLTHDQVDAVEAHGTGTTLGDPIEAGALHATYGHHHTPDQPLWLGSIKSNIG·
HTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTVRLLTEPIQWPNTDHPRT
AAVSSFGISGTNAHLILQQPPTPDTTQTPNPTTGSDPAVGSDSAVGSDPAVGVLVWPLSA
RSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIEHHSENNHDTT
DALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLYRQFPVFAHAL
DEVAAALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQPALFALGTALHRLFTHAGIHPD
YLLGHSIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCTPGGTMLALQASEAEVQPLLEG
LDHAVSIAAINGATSIVLSGDHDSLEQIGEHFITQDRRTTRLQVSHAFHSPHMDPILEQF
RQIAAQLTFSAPTLPILSNLTGQIARHDQLASPDYWTQQLRNTVRFHDTVAALLGAGEQV·
FLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHCHGISPSWNVL
YCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENRGWVFTGRISP
RTQPWLNEHAVESAVLFPNTGFVELALHVADRAGYSSVNELIVHTPLLLAGHDTADLQIT
VTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHNHLPLTPVPWP.
PPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELPEDTDIDGYGI
HPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATHATRLRVRLTR
TGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWPPHPDTTTDTD
TDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSNEELQAHQASD
TAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPDLAHAAVWGLI
RSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRLTRHSSDGALT
APVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHGATDLQQRLTDL

FIGURE 12

GAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELTGDQLDQVLAPK
IDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALADYRHRLGLPATS
LAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQPVSIPAPINTH
TLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTLATLVAAATATV
LGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLNLSSTLIFDHPTPHAVAEHLLE
QIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVIAGRDVVGNFPAD
RGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAMDPQQRLLLEVCW
EALETAGIPAHTLAGTSTGVFVGAGAQSYGATNSDDAEGYAMTGGATSVMSGRIAYTLGL
EGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAIFTEFSRQRGLAPDG
RCKAFAATADGTGWGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQDGASNGLTAPHGP
SQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEAGALHATYGHHHTPDQPLWLGSI
KSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTVRLLTEPIQWPNT
DHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNPTTGSDPAVGSDSAVGSDPAVGVLV
WPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIEHHSEN
NHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLYRQFPV
FAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQPVLFSVMVSLAALWRWAGIT
PDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLAGAGAMASVLSPEEPLTQLL
ARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDARAIPVDYPSHSPYMEHIRH
QFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYWYRNIRNTVRFHDTVAALLG
AGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHCHGISP
SWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENRGWVFT
GRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLLLAGHDTA
DLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHNHLPLT
PVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELPEDTDI
DGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATHATRLR
VRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWPPHPDT
TTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSNEELQA
HQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPDLAHAA
VWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRLTRTAV
LTPPDSGPWRLDTTGKGDLANLALLPTAHTALASGQIRIDVRAAGLNFHDVVVALGLIPD
DGFGGEAAGVISEIGPDVYGFAVGDAVTGMTVSGAFAPSTVADHRMVMTIPARWSFPQAA
SIPVVFLTAYIALAEISGLSRGQRVLIHAGTGGVGMAAIQLAHHLGAEVFATASAAKWST
LEALGVPRDHIASSRTLDFSNAFLDATNGAGVDVVLNCLSGEFVEASLALLPRGGHFVEI
GKTDIRDTEVIAATHPGVIYRALDLLSVSPDHIQRTLAQLSPLFATDTLKPLPTTNYSIY
QAISALRDMSQARHTGKIVLTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLL
TSRRGPQAHGATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAVV
LADTPVTELTGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGLGNYAA
ANTALDALADYRHRLGLPATSLAWGYWQTRTGLTAHLTDVDLARMTRLGLMPIATSHGLA
LFDAALATGQPVSIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNG
LSPQQQQQTLATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLN
LSSTLIFDHPTPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVAS
ADQLWDLVIAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFG
ISPREARAMDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFVGAGAQSYGATNSDGAEG
YAMTGGAISVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVT
VMSTPAIFTEFSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAI
VAGSAINQDGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEAS
ALHATYGHHHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSP
HIDWSSGTVRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTG
SDPAVGSDSAVGSDPAVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLAT
TRSHHPHRATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFV
FPGQGSQYPGMGADLYRQFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVV
QPVLFSVMVSLAALWRWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTD
LAGAGAMASVLSPEEPLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENI
DARAIPVDYPSHSPYMEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTAD
YWYRNIRNTVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKD
RPDAVAFAAALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTH

FIGURE 12(continued)

AMHPLLDTATELAENRGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAG
YSSVNELIVHTPLLLAGHDTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEW
VLHASAVLTAQTTDHNHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIW
RDHATPDVIYAEVELPEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQ
VRLPYAFTGISLHATHATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATG
SAPATTAAGLLHLSWPPHPDTTTDTDTDTDALRYRVIAEPTQQLPRYLHDLHTSTDLHTS
TTEADVVVWPVPVPSNEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVI
VTRHGVSTSAHDPVPDLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTR
ENQLAIRRDTIHIPRLTRHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGV
RHLLLTSRRGPQAHGATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVV
HTAAVLADTPVTELTGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQ
GNYAAANTALDALADYRHRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIAT
SHGLALFDAALATGQPVSIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLA
ARLNGLSPQQQQQTLATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTH
NTGLDLPPTLIFDHPTPTALTQHLHTRLTTGALVPAPVVIAAGRTEEPVAVVGMACRFPG
GVASADQLWDLVIAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDA
GFFGISPREARAMDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFVGAWAQSYGATNSD
DAEGYAMTGGAISVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALA
GGVTVMSTPAVFTDFSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHP
VLAIVAGSAINQDGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDP
IEAGALHATYGHHHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVD
QPSPHIDWSSGTVRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPN
TTTGSDPAVGSDPAVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTR
SHHPHRATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFP
GQGSQYPGMGADLYRQFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQP
VLFSVMVSLAALWRWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLA
GAGAMASVLSPEEPLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDA
RAIPVDYPSHSPYMEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYW
YRNIRNTVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRP
DAVAFAAALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAM
HPLLDTATELAENRGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYS
SVNELIVHTPLLLAGHDTADLQITVTDTDDMGRQSLNIHSHPHIGHDNTTTGDEQPEWVL
HASAVLTAQTTDHNHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRD
HATPDVIYAEVELPEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVR
LPYAFTGISLHATHATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSA
PATTAAGLLHLSWPPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTT
EADVVVWPVPVPSNEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVT
RHGVSTSAHDPVPDLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTREN
QLAIRRDTIHIPRLTRTAVLTPPDSGPWRLDTTGKGDLANLALLPTAHTALASGQIRIDV
RAAGLNFHDVVVALGLIPDDGFGGEAAGVISEIGPDVYGFAVGDAVTGMTVSGAFAPSTV
ADHRMVMTIPARWSFPQAASIPVVFLTAYIALAEISGLSRGQRVLIHAGTGGVGMAAIQL
AHHLGAEVFATASAAKWSTLEALGVPRDHIASSRTLDFSNAFLDATNGAGVDVVLNCLSG
EFVEASLALLPRGGHFVEIGKTDIRDTEVIAATHPGVIYRALDLLSVSPDHIQRTLAQLS
PLFATDTLKPLPTTNYSIYQAISALRDMSQARHTGKIVLTAPVVVDPEGTVLITGGTGTL
GALFAEHLVSAHGVRHLLLTSRRGPQAHGATDLQQRLTDLGAHVTITACDISDPEALAAL
VNSVPTQHRLTAVVHTAAVLADTPVTELTGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFI
MFSSMAGMIGSPGQGNYAAANTALDALADYRHRLGLPATSLAWGYWQTHTGLTAHLTDVD
LARMTRLGLMPIATSHGLALFDAALATGQPVSIPAPINTHTLARHARDNTLAPILSALIT
TPRRRAASAATDLAARLNGLSPQQQQQTLATLVAAATATVLGHHTPESISPATAFKDLGI
DSLTALELRNTLTHNTGLNLSSTLIFDHPTPHAVAEHLLEQIPGIGALVPAPVVIAAGRT
EEPVAVVGMACRFPGGVASADQLWDLVIAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTY
TRYGAFLDDAAGFDAGFFGISPREARAMDPQQRLLLEVCWEALETAGIPAHTLAGTSTGV
FVGAGAQSYGATNSDDAEGYAMTGGATSVMSGRIAYTLGLEGPAITVDTACSSSLVAIHL
ACQSLRNNESQLALAGGVTVMSTPAVFTEFSRQRGLAPDGRCKAFAATADGTGFGEGAAV
LVLERLSEARRNNHPVLAIVAGSAINQDGASNGLTAPHGPSQQRVINQALANAGLTHDQV
DAVEAHGTGTTLGDPIEAGALHATYGHHHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMI
QAITHATLPATLHVDQPSPHIDWSSGTVRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHL

FIGURE 12(continued)

ILQQPPTPNPTQTPEDCSPAQSPCATITDAGTGLSFVPWVISAKSAEALSAQASRLLTRL
DDDPVVDAIDLGWSLIATRSMFEHRAVVVGADRHQLQRGLAELASGNLGADVVVGRARAA
GETVMVFPGQGSQRLGMGAQLYEQFPVFAAAFDDVVDALDQYLRLPLRQVMWGDDEGLLN
STEFAQPSLFAVEVALFALLRFWGVVPDYVIGHSVGELAAAQVAGVLSLQDAAKLVSARG
RLMQALPAGGAMVAVAASQHEVEPLLVEGVDIAALNAPGSVVISGDQAAVRLIANRLADR
GYRAHELAVSHAFHSSLMEPMLEEFARLASEIVVEQPQIPLISNVTGQLANADYGSAGYW
VDHIRRPVRFADSVASLEAMGASCFIEVGPASGLGAAIEQSLKSAEPTVSVSALSTDKPE
SVAVLRAAARLSTSGIPVDWQSVFDGRSTQTVNLPTYAFQRQRFWLDANRIGQGDPASQP
QAQNVESRFWEAVEREDVDGLADSIGVTASAMQTVLPALSSWRRAERTQSELDSWRYQVT
WLSSPATPSSITLSGIWLLIVPSELAKTDPVIGCAAALEAHGALVTIITIFEPDFNRSLM
GASLKDIGSHISGVISFLGIHGSEFSDSGAVKTLNLVQAMGDVHLDVPLWCLTQGAVSIS
ADDLIRCSSAALVWGLGRVVALEHPGSWGGLVDLPESPDDAAWERLCALLAQPTDEDQFA
IRPSGVFLRRLIHAPATTTSKSSTAWAPRGTVLITGGTGALGAHVARWLAHKYESVDLLL
TSRRGMAADGATELVDDLRTAGASVTVHACDVTDRTSVEAAIAGKSLDAVFHLAGRHQPT
LLTELEDESFSDELAPKVHGAQVLSDITSNLTLSAFVMFSSVAGIWGGKSQGAYAAANAF
LDSLAEKRRTLGLPATSVAWGLWAGGGMGDRPSASGLNLIGLKSMSADLAVQALSDAIDR
PQATLTVASVNWDRFYPTFALARPRPFLHEITEVMAYRESMRSSSASTATLLTSKLAGLT
ATEQRAVTRKLVLDQAASVLGYASTESLDTHESFKDLGFDSLTALELRDHLQTATGLNLS
STLIFDHPTPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASAD
QLWDLVIAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGIS
PREARAMDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFAGAWAQSYGATNSDDAEGYA
MTGGSTSVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVM
STPAIFTEFSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAIVA
GSAINQDGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASAL
HATYGHHHTPDQPLWLGSIKSNIGHTQAAAGEAGVVKMIQAITHATLPATLHVDQPSPHI
DWSSGTVRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSD
PAVGSDPAVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHR
ATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQY
PGMGADLYRQFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQPVLFSVM
VSLAALWRWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLAGAGAMA
SVLSPEEPLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDARAIPVD
YPSHSPYMEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYWYRNIRN
TVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFA
AALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDT
ATELAENRGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELI
VHTPLLLAGHDTADLQITVTDTDDMGRQSLNIHSHPIHGDNTTTGDEQPEWVLHASAVL
TAQTTDHNHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDV
IYAEVELPEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFT
GISLHATHATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAA
GLLHLSWPPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTTEADVVVWPVPVP
SNEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPV
PDLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIP
RLTRHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAH
GATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTEL
TGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALA
DYRHRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATG
QPVSIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQT
LATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLDLPPTLIFDH
PTPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVI
AGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAM
DPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFAGAWAQSYGATNSDDAEGYAMTGGSTS
VMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFT
EFSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQD
GASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGHH
HTPDQPLWLGSIKSNIGHTQAAAGEAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTV
RLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSDPAVGSDP
AVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSI

FIGURE 12(continued)

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EHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADL
YRQFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQPVLFSVMVSLAALW
RWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLAGAGAMASVLSPEE
PLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDARAIPVDYPSHSPY
MEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYWYRNIRNTVRFHDT
VAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLH
CHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAEN
RGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLLL
AGHDTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDH
NHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVEL
PEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHAT
HATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSW
PPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPS
NEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVP
DLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPR
LTRTAVLTPPDSGPWRLDTTGKGDLANLALLPTAHTALASGQIRIDVRAAGLNFHDVVVA
LGLIPDDGFGGEAAGVISEIGPDVYGFAVGDAVTGMTVSGAFAPSTVADHRMVMTIPARW
SFPQAASIPVVFLTAYIALAEISGLSRGQRVLIHAGTGGVGMAAIQLAHHLGAEVFATAS
AAKWSTLEALGVPRDHIASSRTLDFSNAFLDATNGAGVDVVLNCLSGEFVEASLALLPRG
GHFVEIGKTDIRDTEVIAATHPGVIYRALDLLSVSPDHIQRTLAQLSPLFATDTLKPLPT
TNYSIYQAISALRDMSQARHTGKIVLTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHG
VRHLLLTSRRGPQAHGATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAV
VHTAAVLADTPVTELTGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPG
QGNYAAANTALDALADYRHRLGLPATSLAWGYWQTRGVTAHLTDVDLARMTRLGLMPIA
TSHGLALFDAALATGQPVSIPAPINTHTLARHARDNTLTPILSALITTPRRRAASAATDL
AARLNGLSPQQQQQTLATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLT
HNTGLDLPPTLIFDHPTPTALTQHLHTRLTTGALVPAPVVIAAGRTEEPVAVVGMACRFP
GGVASADQLWDLVIAGRDVVGNFPADRGWDVAGLFDPDPDAVGKTYTRYGAFLDDAAGFD
AGFFGISPREARAMDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFVGAGAQSYGATNS
DDAEGYAMTGGAISVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLAL
AGGVTVMSTPAVFTDFSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNH
PVLAIVAGSAINQDGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGD
PIEAGALHATYGHHHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHV
DQPSPHIDWSSGTVRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQQPPTPDTTQTP
NPTTGSDPAVGSDSAVGSDPAVGVLVWPLSARSAPGLSAQQAARLYQHLSAHPDLDPIDVA
HSLATTRSHHPHRATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPG
KTVFVFPGQGSQYPGMGADLYRQFPVFAHALDEVAAALNPHLDVALLEVMFSQQDTAMAQ
LLDQTFYAQPALFALGTALHRLFTHAGIHPDYLLGHSIGELTAAYAAGVLSLQDAATLVT
SRGRLMQSCTPGGTMLALQASEAEVQPLLEGLDHAVSIAAINGATSIVLSGDHDSLEQIG
EHFITQDRRTTRLQVSHAFHSPHMDPILEQFRQIAAQLTFSAPTLPILSNLTGQIARHDQ
LASPDYWTQQLRNTVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVP
ALRKDRPDAVAFAAALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFS
GANTHAMHPLLDTATELAENRGWVFTGRISPRTQPWLNEHAVESAVLFPNTGFVELALHV
ADRAGYSSVNELIVHTPLLLAGHDTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGD
EQPEWVLHASAVLTAQTTDHNHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQG
VQRIWRDHATPDVIYAEVELPEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTA
DTGDQVRLPYAFTGISLHATHATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPL
TTATGSAPATTAAGLLHLSWPPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHT
STDLHTSTTEADVVVWPVPVPSNEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDT
TGTRLVIVTRHGVSTSAHDPVPDLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTT
ALTLPTRENQLAIRRDTIHIPRLTRHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEH
LVSAHGVRHLLLTSRRGPQAHGATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQ
HRLTAVVHTAAVLADTPVTELTGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAG
MIGSPGQGNYAAANTALDALADYRHRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRL
GLMPIATSHGLALFDAALATGQPVSIPAPINTHTLARHARDNTLAPILSALITTPRRRAA
SAATDLAARLNGLSPQQQQQTLATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALE
LRNTLTHNTGLDLPPTLIFDHPTPTALTQHLHTRLTQIESPNSEDSMLNLKNLDRIESYI
FRNSGEDRAHVIANRLRSILSKWDGTRSPELPAELHLESATDDELFSLANMFRTPTSEIS
PTLEGGRGVN*
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FIGURE 12(continued)

MlsA2 protein
VVSTEENLRVYLKQVITDLHQMQARLRKIEKQRSERVAVVGMACRFPGGVASADQLWDLV
IAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARA
MDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFVGAWAQSYGATNSDGAEGYAMTGGST
SVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVF
TEFSRQRGLAPDGRCKAFAATADGTGWGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQ
DGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGH
HHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGT
VRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSDPAVGSD
SAVGSDPAVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHR
ATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQY
PGMGADLYRQFPVFAHALDEVAAALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQPALF
ALGTALHRLFTHAGIHPDYLLGHSIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCTPGG
TMLALQASEAEVQPLLEGLDHAVSIAAINGATSIVLSGDHDSLEQIGEHFITQDRRTTRL
QVSHAFHSPHMDPILEQFRQIAAQLTFSAPTLPILSNLTGQIARHDQLASPDYWTQQLRN
TVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFA
AALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDT
ATELAENRGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELI
VHTPLLLAGHDTADLQITVTDTDDMGRQSLNIHSHPHIGHDNTTTGDEQPEWVLHASAVL
TAQTTDHNHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDV
IYAEVELPEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFT
GISLHATHATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAA
GLLHLSWPPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVV
WPVPVPSNEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVST
SAHDPVPDLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRR
DTIHIPRLTRTAVLTPPDSGPWRLDTTGKGDLANLALLPTAHTALASGQIRIDVRAAGLN
FHDVVVALGLIPDDGFGGEAAGVISEIGPDVYGFAVGDAVTGMTVSGAFAPSTVADHRMV
MTIPARWSFPQAASIPVVFLTAYIALAEISGLSRGQRVLIHAGTGGVGMAAIQLAHHLGA
EVFATASAAKWSTLEALGVPRDHIASSRTLDFSNAFLDATNGAGVDVVLNCLSGEFVEAS
LALLPRGGHFVEIGKTDIRDTEVIAATHPGVIYRALDLLSVSPDHIQRTLAQLSPLFATD
TLKPLPTTNYSIYQAISALRDMSQARHTGKIVLTAPVVVDPEGTVLITGGTGTLGALFAE
HLVSAHGVRHLLLTSRRGPQAHGATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPT
QHRLTAVVHTAAVLADTPVTELTGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMA
GMIGSPGQGNYAAANTALDALADYRHRLGLPATSLAWGYWQTRTGVTAHLTDVDLARMTR
LGLMPIATSHGLALFDAALATGQPVSIPAPINTHTLARHARDNTLTPILSALITTPRRRA
ASAATDLAARLNGLSPQQQQQTLATLVAAATATVLGHHTPESISPATAFKDLGIDSLTAL
ELRNTLTHNTGLDLPPTLIFDHPTPHALTQHLHTRLTQSHTPVGPIASLLSHAIDEGKFR
AGADLLMAASNLNQSFSNMAELNQLPAVTDIADASPDGLLTLICISTSENEYARLAAANI
HSLTFAEIAAPGFYDAQLPNSIETSAEALATAITGAYANTSIVLVAHSIVCELAQATMTR
LQDADIDLVGLVLLDPLEGTNSTEDYVETVLTRIEHINAPRVGVDGYLAALGRYLQFHED
RRIPIPETRHMTLHSDTKIDRAQTPMNLLQDEAALTALKIGNWMNDTGSIAVTLRDGPVF
LGRARSVNMR*

FIGURE 13

MslB protein
VIFGDAHQNCRGGRVLGDAVAVVGMSCRVPGASDPDALWALLRDGISVVDEIPSARWNLD
GLVAHRLTDEQRSALRHGAFLDDVEGFDAAFFGINPSEAGSMDPQQRLMLELTWAALEDA
RIVPEHLSGSSSGVFTGAMSDDYTTAVTYRAAMTAHTFAGTHRSLIANRVSYTLGLRGPS
LVIDTGQSSSLVAVHVAMESLRREETSLAIAGGIHLNLSLAAALSAAHFGALSPDGRCYT
FDARANGYVRGEGGGVVVLKRLNDALADGNHIYCVIRGSSVNNDGATQDLTAPGVDGQRQ
ALLQAYERAEIDPSEVQYVELHGTGTRLGDPTEAHSLHSVFGTSTVPRSPLLVGSIKTNI
GHLEGAAGILGLIKTALAVHHRQLPPSLNYTVPNPKIPLEQLGLRVQTTLSEWPDLDKPL
TAGVSSFSMGGTNAHLILQQPPTPDTTQTPNPTTGSDPAVGSDPAVGVLVWPLSARSAPG
LSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIEHHSENNHDTTDALAA
LHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLYRQFPVFAHALDEVAA
ALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQPALFALGTALHRLFTHAGIHPDYLLGH
SIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCTPGGTMLALQASEAEVQPLLEGLDHAV
SIAAINGATSIVLSGDHDSLEQIGEHFITQDRRTTRLQVSHAFHSPHMDPILEQFRQIAA
QLTFSAPTLPILSNLTGQIARHDQLASPDYWTQQLRNTVRFHDTVAALLGAGEQVFLELS
PHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHCHGISPSWNVLYCQAR
PLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENRGWVFTGRISPRTQPW
LNEHAVESAVLFPNTGFVELALHVADRAGYSSVNELIVHTPLLLAGHDTADLQITVTDTD
DMGRQSLNIHSHPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHNHLPLTPVPWPPPGTA
AIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELPEDTDIDGYGIHPALF
DAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATHATRLRVRLTRTGADA
ITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWPPHPDTTTDTDTDTDA
LRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSNEELQAHQASDTAVSS
RIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPDLAHAAVWGLIRSAQN
EHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRLTRHSSDGALTAPVVV
DPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHGATDLQQRLTDLGAHVT
ITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELTGDQLDQVLAPKIDAAW
QLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALADYRHRLGLPATSLAWGY
WQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQPVSIPAPINTHTLARH
ARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTLATLVAAATATVLGHHT
PESISPATAFKDLGIDSLTALELRNTLTHNTGLNLSSTLIFDHPTPHAVAEHLLEQIPGI
GALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVIAGRDVVGNFPADRGWDV
EGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAMDPQQRLLLEVCWEALET
AGIPAHTLAGTSTGVFVGAWAQSYGATNSDDAEGYAMTGGATSVMSGRIAYTLGLEGPAI
TVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFTEFSRQRGLAPDGRCKAF
AATADGTGWGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQDGASNGLTAPHGPSQQRV
INQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGHHHTPDQPLWLGSIKSNIG
HTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTVRLLTEPIQWPNTDHPRT
AAVSSFGISGTNAHLILQQPPTPNPTQTPEDCSPAQSPCATITDAGTGLSFVPWVISAKS
AEALSAQASRLLTRLDDDPVVDAIDLGWSLIATRSMFEHRAVVVGADRHQLQRGLAELAS
GNLGADVVVGRARAAGETVMVFPGQGSQRLGMGAQLYEQFPVFAAAFDDVVDALDQYLRL
PLRQVMWGDDEGLLNSTEFAQPSLFAVEVALFALLRFWGVVPDYVIGHSVGELAAAQVAG
VLSLQDAAKLVSARGRLMQALPAGGAMVAVAASQHEVEPLLVEGVDIAALNAPGSVVISG
DQAAVRLIANRLADRGYRAHELAVSHAFHSSLMEPMLEEFARLASEIVVEQPQIPLISNV
TGQLANADYGSAGYWVDHIRRPVRFADSVASLEAMGASCFIEVGPASGLGAAIEQSLKSA
EPTVSVSALSTDKPESVAVLRAAARLSTSGIPVDWQSVFDGRSTQTVNLPTYAFQRQRFW
LDANRIGQGDPASQPQAQNVESRFWEAVEREDVDGLADSIGVTASAMQTVLPALSSWRRA
ERTQSELDSWRYQVTWLSSPATPSSITLSGIWLLIVPSELAKTDPVIGCAAALEAHGALV
TIITIFEPDFNRSLMGASLKDIGSHISGVISFLGIHGSEFSDSGAVKTLNLVQAMGDVHL
DVPLWCLTQGAVSISADDLIRCSSAALVWGLGRVVALEHPGSWGGLVDLPESPDDAAWER
LCALLAQPTDEDQFAIRPSGVFLRRLIHAPATTTSKSSTAWAPRGTVLITGGTGALGAHV
ARWLAHKYESVDLLLTSRRGMAADGATELVDDLRTAGASVTVHACDVTDRTSVEAAIAGK
SLDAVFHLAGRHQPTLLTELEDESFSDELAPKVHGAQVLSDITSNLTSAFVMFSSVAGI
WGGKSQGAYAAANAFLDSLAEKRRTLGLPATSVAWGLWAGGGMGDRPSASGLNLIGLKSM
SADLAVQALSDAIDRPQATLTVASVNWDRFYPTFALARPRPFLHEITEVMAYRESMRSSS
ASTATLLTSKLAGLTATEQRAVTRKLVLDQAASVLGYASTESLDTHESFKDLGFDSLTAL

FIGURE 14

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ELRDHLQTATGLNLSSTLIFDHPTPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAV
VGMACRFPGGVASADQLWDLVIAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAF
LDDAAGFDAGFFGISPREARAMDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFVGAWA
QSYGATNSDDAEGYAMTGGATSVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLR
NNESQLALAGGVTVMSTPAVFTEFSRQRGLAPDGRCKAFAATADGTGWGEGAAVLVLERL
SEARRNNHPVLAIVAGSAINQDGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAH
GTGTTLGDPIEASALHATYGHHHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHA
TLPATLHVDQPSPHIDWSSGTVRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPP
TPNPTQTPEDCSPAQSPCATITDAGTGLSFVPWVISAKSAEALSAQASRLLTRLDDDPVV
DAIDLGWSLIATRSMFEHRAVVVGADRHQLQRGLAELASGNLGADVVVGRARAAGETVMV
FPGQGSQRLGMGAQLYEQFPVFAAAFDDVVDALDQYLRLPLRQVMWGDDEGLLNSTEFAQ
PSLFAVEVALFALLRFWGVVPDYVIGHSVGELAAAQVAGVLSLQDAAKLVSARGRLMQAL
PAGGAMVAVAASQHEVEPLLVEGVDIAALNAPGSVVISGDQAAVRLIANRLADRGYRAHE
LAVSHAFHSSLMEPMLEEFARLASEIVVEQPQIPLISNVTGQLANADYGSAGYWVDHIRR
PVRFADSVASLEAMGASCFIEVGPASGLGAAIEQSLKSAEPTVSVSALSTDKPESVAVLR
AAARLSTSGIPVDWQSVFDGRSTQTVNLPTYAFQRQRFWLDANRIGQGDPASQPQAQNVE
SRFWEAVEREDVDGLADSIGVTASAMQTVLPALSSWRRAERTQSELDSWRYQVTWLSSPA
TPSSITLSGIWLLIVPSELAKTDPVIGCAAALEAHGALVTIITIFEPDFNRSLMGASLKD
IGSHISGVISFLGIHGSEFSDSGAVKTLNLVQAMGDVHLDVPLWCLTQGAVSISADDLIR
CSSAALVWGLGRVVALEHPGSWGGLVDLPESPDDAAWERLCALLAQPTDEDQFAIRPSGV
FLRRLIHAPATTTSKSSTAWAPRGTVLITGGTGALGAHVARWLAHKYESVDLLLTSRRGM
AADGATELVDDLRTAGASVTVHACDVTDRTSVEAAIAGKSLDAVFHLAGRHQPTLLTELE
DESFSDELAPKVHGAQVLSDITSNLTLSAFVMFSSVAGIWGGKSQGAYAAANAFLDSLAE
KRRTLGLPATSVAWGLWAGGGMGDRPSASGLNLIGLKSMSADLAVQALSDAIDRPQATLT
VASVNWDRFYPTFALARPRPFLHEITEVMAYRESMRSSSASTATLLTSKLAGLTATEQRA
VTRKLVLDQAASVLGYASTESLDTHESFKDLGFDSLTALELRDHLQTATGLNLSSTLIFD
HPTPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLV
IAGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARA
MDPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFVGAWAQSYGATNSDDAEGYAMTGGAI
SVMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALTGGVTVMSTPAIF
TEFSRQRGLAPDGRCKAFAATADGTGWGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQ
DGASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGH
HHTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGT
VRLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSDPAVGSD
PAVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTS
IEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGAD
LYRQFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQPVLFSVMVSLAAL
WRWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLAGAGAMASVLSPE
EPLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDARAIPVDYPSHSP
YMEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYWYRNIRNTVRFHD
TVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQL
HCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAE
NRGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLL
LAGHDTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTD
HNHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVE
LPEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHA
THATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLS
WPPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVP
SNEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPV
PDLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIP
RLTRHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAH
GATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTEL
TGDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALA
DYRHRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATG
QPVSIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQT
LATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLDLPPTLIFDH
PTPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVI
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FIGURE 14(continued)

AGRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAM
DPQQRLLLEVCWEALETAGIPAHTLAGTSTGVFAGAWAQSYGATNSDDAEGYAMTGGSTS
VMSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFT
EFSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQD
GASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGHH
HTPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTV
RLLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNPTTGSDPAVGSDP
AVGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSI
EHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADL
YRQFPVFAHALDEVAAALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQPALFALGTALH
RLFTHAGIHPDYLLGHSIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCTPGGTMLALQA
SEAEVQPLLEGLDHAVSIAAINGATSIVLSGDHDSLEQIGEHFITQDRRTTRLQVSHAFH
SPHMDPILEQFRQIAAQLTFSAPTLPILSNLTGQIARHDQLASPDYWTQQLRNTVRFHDT
VAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLH
CHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAEN
RGWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLLL
AGHDTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDH
NHLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVEL
PEDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHAT
HATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSW
PPHPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPS
NEELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVP
DLAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPR
LTRHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHG
ATDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELT
GDQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALAD
YRHRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQ
PVSIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTL
ATLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLDLPPTLIFDHP
TPHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVIA
GRDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAMD
PQQRLLLEVCWEALETAGIPAHTLAGTSTGVFAGAWAQSYGATNSDDAEGYAMTGGATSV
MSGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFTE
FSRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQDG
ASNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGHHH
TPDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTVR
LLTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSDPAVGSDPA
VGVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIE
HHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLY
RQFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQPVLFSVMVSLAALWR
WAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLAGAGAMASVLSPEEP
LTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDARAIPVDYPSHSPYM
EHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYWYRNIRNTVRFHDTV
AALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHC
HGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENR
GWVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLLLA
GHDTADLQITVTDTDDMGRQSLNIHSHPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHN
HLPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELP
EDTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATH
ATRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWP
PHPDTTTDTDTDTDALRYRVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSN
EELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPD
LAHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRL
TRHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHGA
TDLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELTG
DQLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALADY
RHRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQP

FIGURE 14(continued)

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VSIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTLA
TLVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLDLPPTLIFDHPT
PHAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVIAG
RDVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAMDP
QQRLLLEVCWEALETAGIPAHTLAGTSTGVFAGAWAQSYGATNSDDAEGYAMTGGATSVM
SGRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFTEF
SRQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQDGA
SNGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGHHHT
PDQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTVRL
LTEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSDPAVGSDPAV
GVLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIEH
HSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLYR
QFPVFAHALDACDAALQPFTGWSVLAVLHDEPEAPSLERVDVVQPVLFSVMVSLAALWRW
AGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLAGAGAMASVLSPEEPL
TQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDARAIPVDYPSHSPYME
HIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYWYRNIRNTVRFHDTVA
ALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHCH
GISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENRG
WVFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLLLAG
HDTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHNH
LPLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELPE
DTDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATHA
TRLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWPP
HPDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSNE
ELQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPDL
AHAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRLT
RHSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHGAT
DLQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELTGD
QLDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALADYR
HRLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQPV
SIPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTLAT
LVAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLDLPPTLIFDHPTP
HAVAEHLLEQIPGIGALVPAPVVIAAGRTEEPVAVVGMACRFPGGVASADQLWDLVIAGR
DVVGNFPADRGWDVEGLFDPDPDAVGKTYTRYGAFLDDAAGFDAGFFGISPREARAMDPQ
QRLLLEVCWEALETAGIPAHTLAGTSTGVFAGAWAQSYGATNSDDAEGYAMTGGATSVMS
GRIAYTLGLEGPAITVDTACSSSLVAIHLACQSLRNNESQLALAGGVTVMSTPAVFTEFS
RQRGLAPDGRCKAFAATADGTGFGEGAAVLVLERLSEARRNNHPVLAIVAGSAINQDGAS
NGLTAPHGPSQQRVINQALANAGLTHDQVDAVEAHGTGTTLGDPIEASALHATYGHHHTP
DQPLWLGSIKSNIGHTQAAAGAAGVVKMIQAITHATLPATLHVDQPSPHIDWSSGTVRLL
TEPIQWPNTDHPRTAAVSSFGISGTNAHLILQQPPTPDTTQTPNTTTGSDPAVGSDPAVG
VLVWPLSARSAPGLSAQAARLYQHLSAHPDLDPIDVAHSLATTRSHHPHRATITTSIEHH
SENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQGSQYPGMGADLYRQ
FPVFAHALDEVAAALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQPALFALGTALHRLF
THAGIHPDYLLGHSIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCTPGGTMLALQASEA
EVQPLLEGLDHAVSIAAINGATSIVLSGDHDSLEQIGEHFITQDRRTTRLQVSHAFHSPH
MDPILEQFRQIAAQLTFSAPTLPILSNLTGQIARHDQLASPDYWTQQLRNTVRFHDTVAA
LLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRPDAVAFAAALGQLHCHG
ISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAMHPLLDTATELAENRGW
VFTGRISPRTQPWLNEHAVESAVLFPGTGFVELALHVADRAGYSSVNELIVHTPLLLAGH
DTADLQITVTDTDDMGRQSLNIHSRPHIGHDNTTTGDEQPEWVLHASAVLTAQTTDHNHL
PLTPVPWPPPGTAAIEVDDFYDDLAAQGYNYGPTFQGVQRIWRDHATPDVIYAEVELPED
TDIDGYGIHPALFDAALHPLLALTQPPTNDTDDTNTADTGDQVRLPYAFTGISLHATHAT
RLRVRLTRTGADAITVHTSDTTGAPVAIIDSLITRPLTTATGSAPATTAAGLLHLSWPPH
PDTTTDTDTDTDALRYQVIAEPTQQLPRYLHDLHTSTDLHTSTTEADVVVWPVPVPSNEE
LQAHQASDTAVSSRIHTLTRQTLTVVQDWLTHPDTTGTRLVIVTRHGVSTSAHDPVPDLA
HAAVWGLIRSAQNEHPGRFTLLDTDDNTNSDTLTTALTLPTRENQLAIRRDTIHIPRLTR
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FIGURE 14(continued)

HSSDGALTAPVVVDPEGTVLITGGTGTLGALFAEHLVSAHGVRHLLLTSRRGPQAHGATD
LQQRLTDLGAHVTITACDISDPEALAALVNSVPTQHRLTAVVHTAAVLADTPVTELTGDQ
LDQVLAPKIDAAWQLHQLTYEHNLSAFIMFSSMAGMIGSPGQGNYAAANTALDALADYRH
RLGLPATSLAWGYWQTHTGLTAHLTDVDLARMTRLGLMPIATSHGLALFDAALATGQPVS
IPAPINTHTLARHARDNTLAPILSALITTPRRRAASAATDLAARLNGLSPQQQQQTLATL
VAAATATVLGHHTPESISPATAFKDLGIDSLTALELRNTLTHNTGLDLPPTLIFDHPTPH
ALTQHLHTRLTQSHTPVGPIASLLSHAIDEGKFRAGADLLMAASNLNQSFSNMAELNQLP
AVTDIADASPDGLLTLICISTSENEYARLAAANIHSLTFAEIAAPGFYDAQLPNSIETSA
EALATAITGAYANTSIVLVAHSIVCELAQATMTRLQDADIDLVGLVLLDPLEGTNSTEDY
VETVLTRIEHINAPRVGVDGYLAALGRYLQFHEDRRIPIPETRHMTLHSDTKIDRAQTPM
NLLQDEAALTALKIGNWMNDVGVALSVNLE*

FIGURE 14(continued)

Mup045 protein
VIWNDIYISGTGRFIPSMRPINDIQVDGVPNDHTIVQSDYISFTEADEPATVMATRAATE
ALTTSELVSADVGVLIYAAIIGDAHHFAPVCHVQRVLRAPDALAFELSAASNGGTQGIAV
AANLMTADASVKAALVCTAYRHPIDIISRWSSGMVFGDGAAAAVLSRDGGMVRLISGYHG
SLPELEVLARNRSNERLGFVLPDVGLGKYLTAIARMYQAVIAQVLEEAQTSIAEIDYFGL
IGIGIPSLTATILEPNGIPVNKTSWGLLRQMGHVGACDPLLSLNHLFEQNVLKRGDKVLL
LGGGVGYRLTCIVAEIAMNPGVPGHSTS*

FIGURE 15

Mup053 protein
VRQRLNWIAAHGLLRGTARLAARLGDVQSRLVADPMVMANPAPFCDELRAIGPVVSSYGT
HLVVSHAIAHELLRSEDFEVVSLGSNLPAPMRWLERRTRDDTPHLLLPPSLLAVEPPNHT
RYRKAVSSVFTPKAVAGLRDHVEETASALLDQLTDQASAVDIIARYCSQLPVAVICDILG
VPSRDRNRVLKFGQLAGPCLDFGLTWRQHQQVRQGLQGLHFWITEHLEELRSNPGDDLMS
QMIHASENGSSETHLHATEVRMIGLVLGASFATTMDLLGNGIQVLLDAPELRDALSQRPQ
LWPNAVEEILRLEPPVQLAGRMARKDTEVAGTAIKRGQLVAIYLGAVNRDPSVFADPHRF
DITRANANRHLAFSGGRHFCLGAALARVEGEVGLRMLFERFPDVRAAGPGNRRDTRTLRG
WSQLPVQLGAARSMAIR*

FIGURE 16

Mup038 protein
MIVWPEVVSTVVDVDGVAMSALVAEPDQEPKAVILALHGGATNARYFDCPGHRALSLLHT
GAAAGFTVVALDRPGYGSSAGDPDAMNRPHQRAALAYGALDRILAQRPRGAGVFIMGHSN
GCELAMWMATETRGAELLGIELAGTGWHYQPEAREILTTATGEHRWVGLYDLLWHPQRLY
PPEVLNAAIISSSAPAYEEQMMADWTRRTFLELVPAVRVPVHFSIAQHEKVWQRDSSALD
EIAVLFSGAPRFILHEQPEAGHNISLGHTAGDYHTTVLSFVQQCLAERLANAQQDVDLAA
E*

FIGURE 17

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atgccagcac cgagcgtgtt tgtcggcctg gaactcgaca ccaacagtta caccggtgtg 60
ccgtgctgga gcgctggccc cgcccactgg gcccacaaca ccgtcgcggt ggcctacgac 120
ctgcgctatc aacagatccg gtcgctgatg tgtgacggcg gcatcgcccg aaaaaccctg 180
atcgtcatcg ccgcggccat ggcacgtcac gccgactgga gcaccggccg caactgccgg 240
cccaccaaca accagctcga agccgcgaca ggcttccacc agcgcaccat ccagcgggcc 300
cacgaatgcc tacgcctact cggggtggct accgaggtgc tgcgcggccg ccaacgcacc 360
tacatcgagc gcatggcctc ctggagaatg ggcgatcgcc accgcggctg ggcgtccgtg 420
tgggcactac acgacaacgg cgaggtcgca cgggttgtcc acagcttgtc accccacctg 480
gaacggtcct cagtaaccac acacacctca cctaaaacaa gcctgtttac tacccacccg 540
ggcgccacac gcgcccggga aagcggcgct acgcgccgca acagcccaga cgcccggggc 600
cggcgacttg cggctcaatg gcgagcagac ccccatgctc ccccatggac tcgtcggtac 660
agccctacga gctggtcagc aatgctcgct gcccccgcag ccgcaggttg gactgcacgc 720
gacctgaccg cattggtaca agactggctc ggtaccggtc accgaatacc gtccactcca 780
gcgcgcccga tcgccctgct cggcacactg cttgcttggc ataccagcca caacagcatc 840
caacaccgcc cagctgcact cgaggaagca cgcgaggccg cagacctggc cgcggttcgc 900
aaacggattc aaaaacaaac cgctgaacac cacgccaatc tcgcggcgac agaagccggc 960
cgcgccgcac tgggcggtcc cggccaccag gccgccagaa ttgctgccgc tgctgctgct 1020
cgcaacgccc ccgacggcg caccaaaatg gtcgcggcag aagtagcgag cgtcgatgcg 1080
gcgatccggc gggcccgcgg ccgctaaccc agcggcctac gctgacagca gttcggtgcg 1140
atcgagcagc gatgctgccg tgcgcctaat caactccacc ggatcgatcc cttgctgctc 1200
agctaccggc accagttccg tcagcaagtc gccgcactgg cgaataagac ccggcaactt 1260
tgttcctgcc gccgcctcga gctctcgaag cttggtggta tcgaaacgta cctgcagccg 1320
gcccgccata ttgcggttct ctgagccctg acgccgtttg cgccgcagag cctcttgctc 1380
tgcagacccg gccgtggcgc actggcgctt gaactcgggc gcgtttgtca tgggaactcc 1440
ttcaatagtg cgggatcgtc gagccggctc gggcggctac gacatgtaag ccaacttgca 1500
gcaaccctgc tgcgccacac gcgctcatgt aagccagaat ttttgctcgc cccaactccc 1560
atcgcccccc aagaaccgta gagagcaggc tttgaactgc ggatatcagc cgccgttgtg 1620
gcaatgcgcg actggtaaac atgtaagtaa gtttgccata gaacgaggtt ttgcataccg 1680
gatctcgcgg cgcgtgtcac gaaagtggcg caggacttta cttacatacc ccctcctgcg 1740
caagaatggg accgtgtcat cgcccagcga accgtcgccg tatacgctcg ccgatgccgg 1800
caagcagttg ggcgtcaccg cccagccgt gagccaaatg ctgagcagcg gcgagctgac 1860
aggcccgcaa tatccacaac aacgggttcc caagaacgcg gtgcgcgtct ggaaatggtc 1920
gctcgaccag gagttggcac gaagaaggtc cactcccccg ccacgtcact cacgcagaca 1980
acaacccgac cccggtgccg atcagggta cctcgcacac tggtggagcc gccgggaagc 2040
gcgcgtcaac gccgctgcgc acgaactcaa agttgccgca gacctcgctc gacagcatgc 2100
cagcgacgag cgtcgaaaag cccgacagct gatgtcgaag ctcgcgcgac tgaccatcca 2160
gcaggctgaa ctcatcgaac ggctaaaaga cgacctcgca gtggaatcgg aacgtaccga 2220
acagatcatc gatgcttact ccgatgcctt aacccagctc ctggccccg acttcggccc 2280
accaccgtga cccgcgatca gcaggtcaat caggcgtcct tcctgccggg caggaacgca 2340
ttgagcacag gggcgatcca cgtcgatcgg gtatcgaatc ccaactttga gccgatggtg 2400
tcgatgacct cctcttgctc ggcggtcaga ctaaacgcga tctgcgcgct gccaccaccg 2460
agatagcgca cggccgaagg gtcggccggg aaaaggtcgt gggtaggtgc agtcgagtac 2520
cggctcttct cgatgatctc ggccagttca ccagcctgct acttgatgct gatcgcctcc 2580
aaaaccacat gcaaattggt tgacttcacg ttgtgccgat acttctcgaa gcggctcttg 2640
acgccaggac tgacatatac cgccgtggtc ggcttggacc gagtgcgtgg ccggccaggc 2700
ttgcgtgcgg gcactttggc ggccgagaca tcagaggtct tagagggcgt tgcggcaacc 2760
ggtctgtcct caacaggtac ctcgacagca gcctgttcgg gagcactggc gggccgaggc 2820
tgggctgcgt tgacgaggtc agctagacca gccgcgcgac tcttcggctt tgtgaggtct 2880
gcgagatccg cttcgggcag ctcctgcggc gttaacttgc tcacggccac actccttcgt 2940
tgatcaggtc ctggcggatc tttgaacccc gcgtgagaat ttctccggtc agcttggcga 3000
agtcctcggc cacgctcaca gatgtcgtgc tgacgaccgt agtcgcatct gctctcccct 3060
gccgtcatcgc tgaccgagac ggattattga cgatttcctg ctcaagttcg tgggccaacc 3120
gaccaaactt aggcacgtcc ctgccaacag cttctgagtg gcggatgaac gaatcgagca 3180
tcacgtcatc gttctgcccc aaatctgcag ccacattctt cttcatctct tcccggatcc 3240
tcgtcgatga agttcctgac gcaaacacga aacagccgag caacaccaca gatgggttgt 3300
gctcgcgcat cgcccttaga tcgcctgcca actcgcgcag tccggtcctt gataggtcat 3360
cggtcttcat cggaactaca acaaaccgcg acgcacacag ggccgcctga agaagcaact 3420
ggttctccgg aggggaatca atgaagataa ccccgtaatg atcactgatc tgtgccaacg 3480
ccagcgccag cgacatcagc acctgtttgg cagtctgcgg gttgcccatc tctgcagcca 3540
tcaccggcgc gatccgacgg acgaaaggcc caccgggaac aacatccaat cccggacgga 3600
catcgggaat cggggtcaac gcagcgccgg cagtaatcgc gctgtagaga ttcctaccct 3660
tgtcgtcggc ttctgtattc gcgaagccaa gcatgttcgc cacgttgccc tggccgttga 3720
gatcgaccaa taaggcgcgc gctccatcgg aggcaacgag cgcggcgctg tgggtagaac 3780
acgtcgactt ccctaccca cccttgccgt tggcgaacag ataaacattg cccagcttgc 3840
tccaattgac cgcgggttct accagcccag cgtcgtccca aacggctacg cttctactca 3900
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FIGURE 18

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tgcgggcgcc ttactgtgtt ggaatcggga gaatgccgcg cctggcatgc cgcgcaccga 3960
accgcactgc accccacgcg ctgtcacggt ctgcagagtc tagggcgatc agctcggtgt 4020
catatcccta ctcgtgtccg gttcgcacca tcgcgtgcca cttgggtgac tatgacctac 4080
cgtgcgccca atgccacagc gtctcgccca gcaaacccaa cccaccgatg gaccccggc 4140
gtcgttcagg cgaacgcctg aagccgccct cggcaccagg tgccggatca cgcgatgtcc 4200
accgcttcgt gcaccgttcc ggccagagca aaccagcgta tacagggcaa aacggcgcgc 4260
tgcatatagg gtctgccaat gctctaaccg gaacagtcga cctgccatat caccgcacgt 4320
caaacggtcg gaccgacgcg attcaccgcc cgacacaata cctatataaa tacctgccat 4380
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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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```

FIGURE 18(continued)

```
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FIGURE 18(continued)

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FIGURE 18(continued)

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gttgccggag cagaccctgt ggcggtggtg aggggcgggg tgatcaatga gtcgatgatc 43380
gccaccgggg ctccggtggt gtcactggtg tgcacggtga tggcatcggc gccggtacgg 43440
gtcagccgta cccgcaatcg ggtggcgtgg gtggcgtgca aactgatgcc ggtaaaggcg 43500
```

FIGURE 18(continued)

```
tagggcagcc gcacctggtc accggtgtct gcggtgttgg tgtcatcggt gtcgttggtg 43560
gggggttggg tcagggcgag taggggtgt aaagcggcgt cgaatagggc ggggtggatg 43620
ccgtagccgt cgatgtcggt gtcttcgggt agttcaactt cggcgtagat gacatcgggt 43680
gtggcgtggt cacgccatat ccgttgcaca ccttggaatg tcgggccgta gttgtagccc 43740
tgtgcagcca ggtcgtcgta gaagtcatcc acctcgatcg cggctgtgcc gggtggaggc 43800
cacggcacag gcgttagggg gaggtggttg tggtcggtgg tttgtgcggt caggactgcg 43860
ctggcatgca ggacccactc gggttgttca tcgccggtgg tggtgttgtc atggccgata 43920
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cctgggaaca gcacggctga ttcgacggcg tgttcgttta gccatggttg ggtgcgtggg 44160
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ggaaaattac ccaccacatc acggccagcg atcaccaagt cccacaactg atccgctgat 46920
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agcgcagaca ggatcggggc cagggtgttg tcgcgggcgt gtcgggccag ggtgtgggtg 47400
ttgatcgggg cgggtatcga aacgggctgt ccggtggcga gggcggcatc gaacagggcc 47460
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FIGURE 18(continued)

```
agtccgtggc tggtggcgat gggcatcaaa cccaggcggg tcatgcgggc tagatctaca 47520
tcggttagat gcgcggtgag accggtgtga gtctgccagt agccccaggc caggctggtc 47580
gcgggcaagc ccaggcggtg gcggtagtcg gcgagagcat ctaacgcggt gttggctgcc 47640
gcgtagttac cctgaccggg actgcctatc attccggcca tggacgagaa catgatgaat 47700
gcagacaggt tgtgttcgta ggtgagttgg tgcagctgcc atgccgcgtc gattttgggg 47760
gccagcacct ggtcgagttg atcgccggtc aactcggtga ccggggtgtc ggccaatacc 47820
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tgggtgaggc cggcgttggc tagtgcttgg ttgatgacgc gttgttgtga cgggccgtgg 51540
```

FIGURE 18(continued)

```
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gccaggccgc gttggcggga gaactcggtg aaaaccgcag gtgtgctcat cacggtgacg 51780
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aactgatggc ggatgtgttc catatagggg gaatgagagg ggtagtccac cgggatagcg 55560
cgagcgtcga tgttttcgtg ttcgcaggta atcagcaatt cggtgatcgc tgtggtatcg 55620
ccggagacca cagcgctagc gggggccgtta actgcggcga cagtgatctt gccgtcccac 55680
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FIGURE 18(continued)

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cgtgccagca gctgggtcag tggttcctcg ggcgatagca ctgaagccat ggcaccggca 55740
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gtcagggctc cggccacatg tgccgcggcg atctcgccct gggagtggcc gatgactgca 55860
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tcgccttgac cgatacggtt ggcgtcgagc cagaaccgtt gccgctggaa ggcgtaggtg 59760
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FIGURE 18(continued)

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```

FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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accaccgggg aaacgacacg ccatccccac caccgccacc ggctcctcgg tacgaccagc 120060
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ggtgttgtgg gtgagggtgt tgcgcagttc aagggcggtc agcgaatcga ttccgaggtc 120240
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caggttgtgt tcgtaggtga gttggtgcag ctgccatgcc gcgtcgattt tggggggccag 120840
cacctggtcg agttgatcgc cggtcaactc ggtgaccggg gtgtcggcca ataccacggc 120900
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```

FIGURE 18(continued)

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atgccggaca ccatgggcag aaaccagatg ctcggcgaac aaggcaccca gcgtcccggt 121140
cccccggtg atcaacaccg tgccctcagg atctaccacc accggcgcag tgagcacgat 121200
cttgcctgtg tgacgggctt gactcatgtc acgtaaggcc gagatggctt ggtagatgct 121260
gtaattagtg gtcggtaggg gttttagggt gtcggtggca aacagtgggg acagttgggc 121320
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FIGURE 18(continued)

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FIGURE 18(continued)

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gtcggccaat accgcggcgg tgtgcactac cgcggttaaa cggtgttgtg tgggcactga 132720
attgaccagg gcggccagtg cttcgggggtc gctgatatcg caggccgtga tggtgacatg 132780
agcacctaga tcggtgagcc gctgctgcag atcggtggca ccgtgggcct gaggtccgcg 132840
ccgcgaggtc aacaacagat gccggacacc atgggcagaa accagatgct ccgggcatgcg 132900
ggcacccagc gtcccggtcc ccccggtgat caacaccgtg ccctcaggat ctaccaccac 132960
cggcgcagtg agcgcaccgt cactgctgtg tcgggtcagg cggggggatgt ggatggtgtc 133020
gcggcgtatg gccagttggt tttcgcgggt tggcagggtt agggcggtgg tgagggtgtc 133080
gctgttggtg ttgtcgtcgg tgtcgagcag tgtgaagcgt ccggggtgtt cgttttgggc 133140
gctgcggatc aggccccaca ctgcggcgtg ggctaggtcg gggaccgggt cgtgggcact 133200
```

FIGURE 18(continued)

```
ggtgctgacg ccgtggcggg tcacgatgac cagtcgggtg ccggtggtgt cggggtgagt 133260
gagccagtcc tgcaccacgg taagtgtttg gcgggtcagg gtgtgtatcc gagaagacac 133320
cgcggtgtcg gatgcttggt gtgcctggag ctcttcgttg ctgggcaccg gtaccggcca 133380
cacaaccacg tctgcttcgg tggtgctggt gtgcaggtcg gtgctggtgt gtaggtcgtg 133440
caggtagcgg ggcagttgtt gagtggggttc ggcgatcacc tgataccgca gggcatcggt 133500
gtcggtgtcg gtgtcggtcg tggtgtcagg gtgtggtggc cagctcaggt gtagtaggcc 133560
agctgctgtg gttgccggag cagaccctgt ggcggtggtg aggggggcggg tgatcaatga 133620
gtcgatgatc gccaccgggg ctccggtggt gtcactggtg tgcacggtga tggcatcggc 133680
gccggtacgg gtcagccgta cccgcaatcg ggtggcgtgg gtggcgtgca aactgatgcc 133740
ggtaaaggcg tagggcagcc gcacctggtc cccggtgtct gcggtgttgg tgtcatcggt 133800
gtcgttggtg ggggggttggg tcagggcgag tagggggtgt aaagcggcgt cgaatagggc 133860
ggggtggatg ccgtagccgt cgatgtcggt gtcttcgggt agttcaactt cggcgtagat 133920
gacatcgggt gtggcgtggt cacgccatat ccgttgcaca ccttggaatg tcgggccgta 133980
gttgtagccc tgtgcagcca ggtcgtcgta gaagtcatcc acctcgatcg cggctgtgcc 134040
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caggactgcg ctggcatgca ggacccactc gggttgttca tcgccggtgg tggtgttgtc 134160
atggccgata tgtgggtgcg agtggatgtt aagagactgc cggcccatgt catcggtgtc 134220
ggtgacggtg atctgtagat ccgcggtgtc gtggccagca agcagcaggg gggtgtgcac 134280
gatcagttcg ttgaccgagg aatatccggc acggtcagcg acatgcagcg ctagctcgac 134340
aaatccggtg ttcgggaaca gcacggctga ttcgacggcg tgttcgttta gccatggttg 134400
ggtgcgtggg ctgatccggc cggtgaacac ccatccgcgg ttttcggcca gttcggtggc 134460
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gttacgtagc tgttgggtcc aatagtcagg tgaggcgagt tggtcgtggc gggcgatctg 134880
cccggtgagg ttggacaaga tgggcagggt gggtgcgctg aaggtgagtt gggccgcgat 134940
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caggtagtcc gggtggatac cggcgtgggt gaacaatcga tgtagagcgg ttcccagcgg 135360
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atcagaacct gttgtggggt tggggggtttg tgtggtgtcg ggggtggggg gttgttggag 135960
gatgaggtgg gcgttggtgc cacccatgga aaaagatgac acgcccgccg ttagcggttt 136020
gtctaagtcc ggccattcac tgagagtggt ttggacgcgg agccctagct gctctagcgg 136080
gatttttggg ttaggaaccg tgtagttgag gctgggggga agctggcgat gatgaacggc 136140
aagggcagtc ttgattaggc cgaggattcc tgcggcgcct tcgaggtgac cgatattggt 136200
tttgattgac ccgactagca gcgggctgcg cgggaccgtg gatgtgccga agacggagtg 136260
aagcgagtgg gcttcggtgg gatcgccgag tcgggtgccg gtgccatgta gctcgacgta 136320
ttggacttct gaggggtcga tttcggctcg ctcataagct tgaaggagcg cttgacgctg 136380
gccgtcgact ccgggcgctg tcaagtcttg agtggccgcg tcgttgttga ctgagctgcc 136440
gcggatcaca cagtaaatat ggttgccgtc ggctagggcg tcgttgagac gtttgaggac 136500
gacgacgccg ccgccttcgc cacgaacgta tccgttggca cgtcgtcga aggtgtagca 136560
gcgtccgtca ggtgaaaggg ctccaaagtg tgctgcgctc agtcggcgg cgaggctgag 136620
gttaaggtga ataccacccg cgatagcaag tgaagtttct tctctgcgca agctttccat 136680
tgccacgtgc acagccacca gtgaggacga ttgcccggta tcgatgacca aactaggtcc 136740
gcgtagaccg agtgtgtagg agacacggtt ggctatgagg ctgcggtgag tccccgcaaa 136800
ggtatgtgca gtcatcgctg cgcggtaggt caccgcggtc gtgtaatcat cgctcatggc 136860
gccggtaaac accccgctac tgctaccgga aagatgttct ggcacgattc gagcatcttc 136920
gagtgctgcc caggtcagtt caagcatcaa tcgttgctgc ggatccatcg acccagcttc 136980
ggaggggtta attccgaaga acgcggcgtc aaaccccttcg acgtcatcaa gaaaggcgcc 137040
atgccgaagc gctgatcgtt gctcatcggt cagtcggtga gcaacgaggc cgtctaaaatt 137100
ccaacgtgca gaaggtatct catcgaccac actgatcccg tctcgcagca gcgcccacag 137160
agcgtccgga tcagatgcgc caggaacccg gcaagacatt ccgaccactg cgactgcatc 137220
acccaacacc cgacctcccc tgcagttttg gtgagcatct ccgaagatca cgcaccctag 137280
```

FIGURE 18(continued)

```
attgggtact atcacgttaa ttaaaatatg tagtagcgca gttggctgta gtgctggatc 137340
agctttgcat cgttagtatt tcaggcggca gcatcgagaa cggtgacctc ataccegacc 137400
gcgaaccggt cagccatttc ggttcgcgaa tcgatggcgc tgagcagatg tcgtttggcg 137460
ttacgccgcg accgcaccaa cacgtctgaa acgttgccgt cctggtcgat cgcacgccac 137520
agacaacggg tgatcccgtt gaccttcacc aacacctcag ccaggtgcca cttgtcgccc 137580
gggcgggggac gacgtcgatg caacttgccc acccgctgac cccttcctag tccttccagg 137640
tcgccgatgc acaccaacgt gacaatgatc cgccaactgc ggccccagca caccccggga 137700
tccgctagcg gcacaaccga aaccatcagc accaccggtt aacattaccc accgaggcca 137760
gaaccttcgc agcccaattt acaccgaact ccacccactg ttgcaagaaa aatcttgaat 137820
ccacaacgtc ttctagagcc gagtgccttt gacgcagatg tcatttgatc tcacgggcca 137880
cagggcaatg ggccacgggg caatgagtgt ggctgcatcg ggcagcctac tccgcggggg 137940
gcaggtaacc cagtgcggag tgacgatgcc gatgattgtg ttcgtggttg aaatcgtcca 138000
tgaccacgcg gtcttcgagt gggttggtcc agcggctgcg gttgaggcag tcccttcgta 138060
gccggttgtt gaacgattcg atgtagcgtt gttccacggg gttctgggct ggatgtagca 138120
cagccctacc ttgcggtcgc agaactgtcg cagcgcttgg gaaatgagct cagggccatt 138180
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cagcccgtca ctggcctgtc cgccctgctc ggcgatgccc gacgacagga aggacaaccg 138960
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gccatcggct acaccgcggc ggcgacagaa ccggcaacca cgccctgcac atcgccgcag 139860
tcgtgcgcct gcgctacgac ccacgcagcc gcgcctacgc cgaccgccgc acctccgaag 139920
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acgcgctacg cactgacttc accaaactca acacttgaca tctataggag cgtccttgcg 140040
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gttctgttcc cgcagttctt tgagctcctt gcccgcgtcc acgtccatgc gccgtagccg 140160
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gaatacccct tacgaccagc cccgtcgact catcgtccct ccacgccctc attcggggca 140340
tatgacctcc tgatgatcac tctgccctcg actcccgcaa cggcggacct acagcatggg 140400
cacagatcag gcggactcat tggctgggga cacgcgacca tcttcgtggc aaatgatgcc 140460
caccgaatcg tctccctctc tgatcgttta gactgctaac gcggaggaac cacgagatcg 140520
agcgttctcg cacgctacct ctgtgggctc ggcccttgat aacgatctgc aagtcaagag 140580
taacgagata tcggagaacc agcgcgtgat ttggaatgac atctacataa gtggaacggg 140640
gcgtttcatc ccgtcaatgc gaccaattaa tgatatccag gtcgacggtg ttccgaatga 140700
tcatactatc gtgcaatccg attacatttc cttcaccgaa gccgatgagc cggctacagt 140760
catggccacg cgcgctgcaa ccgaagcgct gaccacttcc gagctagtat ccgctgatgt 140820
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agctgcactc gtttgtacag cttaccggca cccgatcgat attatcagcc gttggtcgtc 141060
aggtatggta ttcggcgatg gagcagccga cgccgtgctt tcaagagacg gcggaatggt 141120
gcgattgatt tccgggtatc acggctcact gccggagcta gaggttcttg ctagaaatcg 141180
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tatagcgcgg atgtaccaag cggtaattgc gcaagtacta gaagaggcac aaaactagtat 141300
tgccgagatc gactatttcg gcctgatcgg tataggaatt ccaagtctca cagcgactat 141360
cttagaaccc aacggtattc cagttaataa aacatcctgg ggtttgctaa gacaaatggg 141420
```

FIGURE 18(continued)

```
ccacgttgga gcttgcgatc ccctgctgag ccttaaccac ctattcgagc agaatgtcct 141480
caagcgcggc gacaaagtcc tactcctagg tggcggggtg gggtatcgat tgacatgcat 141540
tgtggctgaa atcgccatga atcccggccgt gcccggacac tccacttcgt agtgaaaagc 141600
gaaggtgaag gccatgtctg tacgtgcgtc aaacaggctc ttcgacgttg gctgggcagt 141660
gagtggtgag tctgggttgc ggcccgccgt ttgcgggtgc agtggaattg tgtccggcgg 141720
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gtacattgct gctgggtctt gagggaatcg tcgttgagac ggtgagtgtg cacgaagacg 141960
gtgtccgtgt ggtcgcggtt gcgctgccga tgagtggatc ggcaaatgtc cgaagtgtgc 142020
gagccgatca tcgcgcccga aggcgtgggt cacgaccgt ctgcgcgata tcaagatcgg 142080
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gatatgaccg ccacgatcgg gctgggtatg gcagtggcaa ctcgcgcaac ggaacccgct 144960
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caggcacatt cgagccgaag atcgtcgaaa aacgccagcg taggttgacc gacgtcgatg 145080
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cccacatcta cgacgcggcg gtgtccaagg acaccgttag ccggatcacc gactgcgttc 145200
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tcgacgccct gcacgtcaag atccgcgacg gccaagtcgg cccccggccg gtctacgccg 145320
cggtcgggt cgatctggcc ggacaccgtg acgtgctggg catgtgggcc ggtgaaggtg 145380
acggcgaatc ggccaagtac tggctggcag tgctgacgga gttgaaaaac cgcggcgtgg 145440
ccgacatctt cttcctggtc tgtgacggcc tcaaaggact gccggactcg gtgagcgcgg 145500
```

FIGURE 18(continued)

```
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FIGURE 18(continued)

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FIGURE 18(continued)

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FIGURE 18(continued)

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```

FIGURE 18(continued)

```
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FIGURE 18(continued)

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<div align="center">FIGURE 18(continued)</div>

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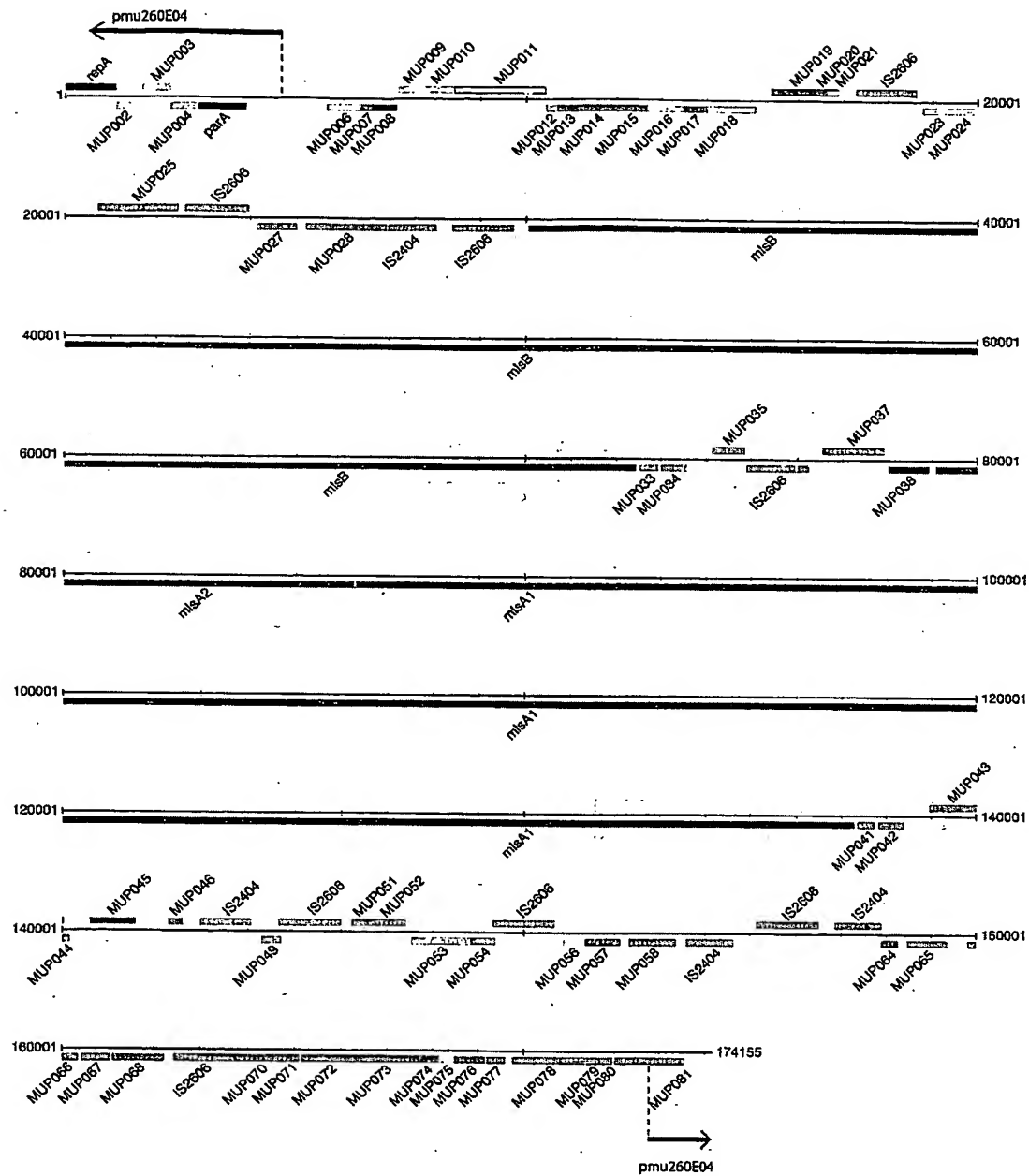
FIGURE 18(continued)

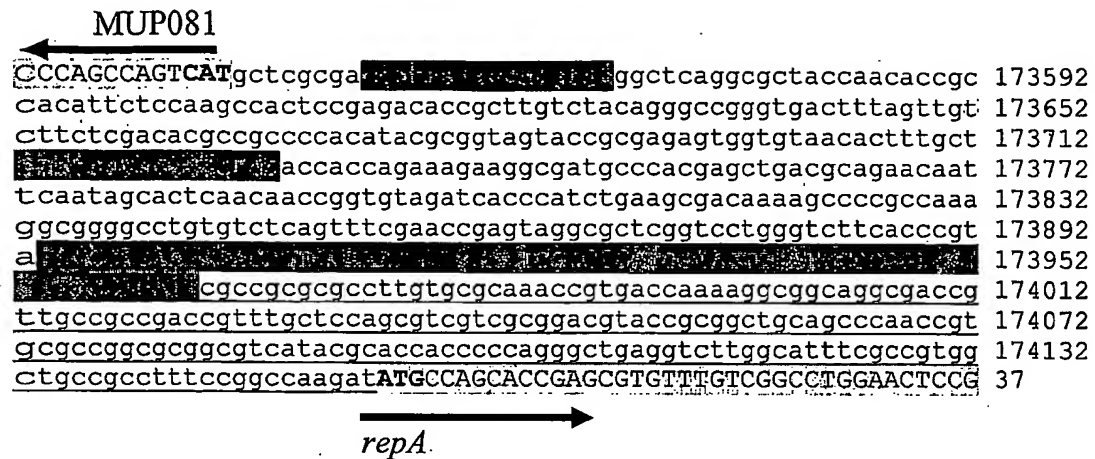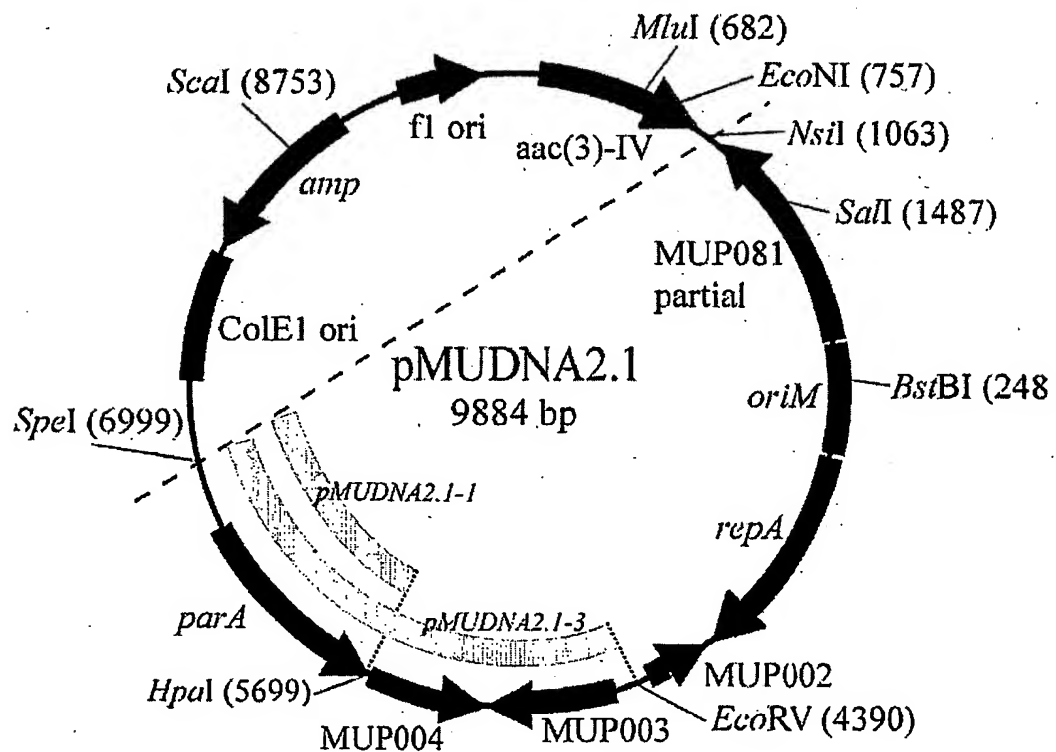**FIGURE 19**

MUP081

```
CCCAGCCAGTCATgctcgcga[████████████]ggctcaggcgctaccaacaccgc 173592
cacattctccaagccactccgagacaccgcttgtctacagggccgggtgactttagttgt 173652
cttctcgacacgccgccccacatacgcggtagtaccgcgagagtggtgtaacactttgct 173712
[████████████]accaccagaaagaaggcgatgcccacgagctgacgcagaacaat 173772
tcaatagcactcaacaaccggtgtagatcacccatctgaagcgacaaaagccccgccaaa 173832
ggcgggggcctgtgtctcagtttcgaaccgagtaggcgctcggtcctgggtcttcacccgt 173892
a[████████████████████████████████████████████████████] 173952
[██████████]cgccgcgcgccttgtgcgcaaaccgtgaccaaaaggcggcaggcgaccg 174012
ttgccgccgaccgtttgctccagcgtcgtcgcggacgtaccgcggctgcagcccaaccgt 174072
gcgccggcgcggcgtcatacgcaccaccccagggctgaggtcttggcatttcgccgtgg 174132
ctgccgcctttccggccaagatATGCCAGCACCGAGCGTGTTTGTCGGCCTGGAACTCCG 37
```

repA

FIGURE 20

FIGURE 21
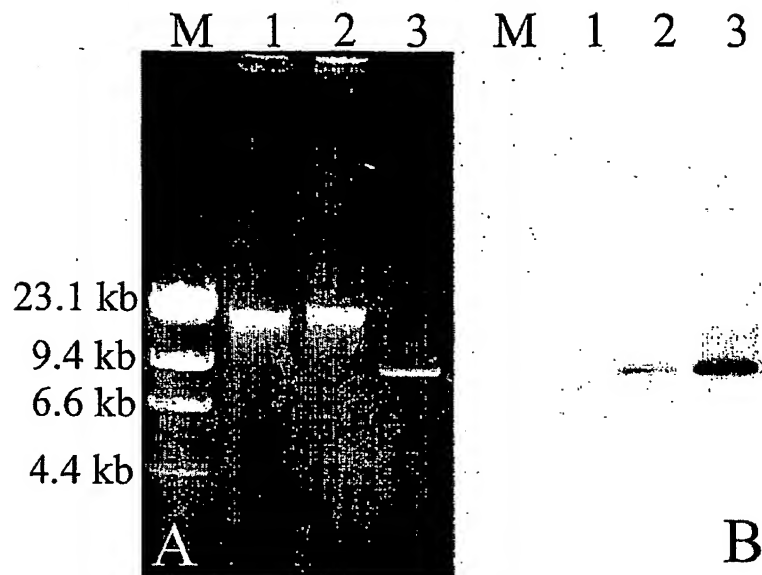
FIGURE 22A   **FIGURE 22B**
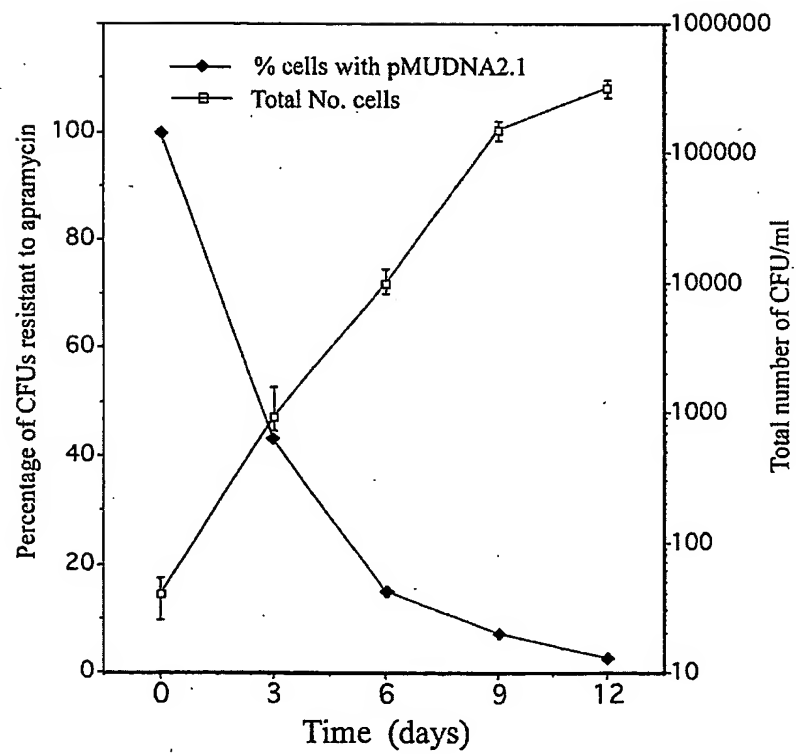
FIGURE 23

```
AGCGCAGGGCGGGGGTGCCCAGG CAGGGC...GCCCTG GGTGCCCAGGTATGGCT  [SEQ ID NO.:59] 10 bp

CGGCGCGGGTTGCTGCGGCGGC CAGGGC...GCCCTG CCGCGGCGGCAAGTCGG  [SEQ ID NO.:60] 10 bp

AACACCGCATTCCCCGGTCACC CAGGGC...GCCCTG CCCGGTCACCGCCGCCG  [SEQ ID NO.:61] 10 bp

GGCAACGGATCTAGCCGGGGTG CAGGGC...GCCCTG AGCCGGGGTGCAGTCGG  [SEQ ID NO.:62] 10 bp

CGAGGCCATCGCCATCGCCGCC GAGGGC...GCCCTG CATCGCCGCCGAACCCT  [SEQ ID NO.:63] 10 bp

ACGATGCCGGAGAATCTCAGCG CAGGGC...GCCCTG AATCTCAGCGCCGGGGG  [SEQ ID NO.:64] 10 bp
```

FIGURE 24
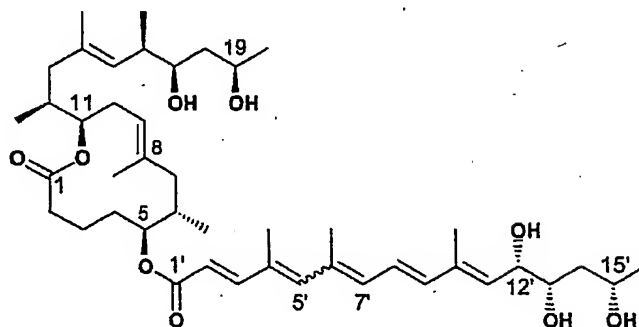
FIGURE 25
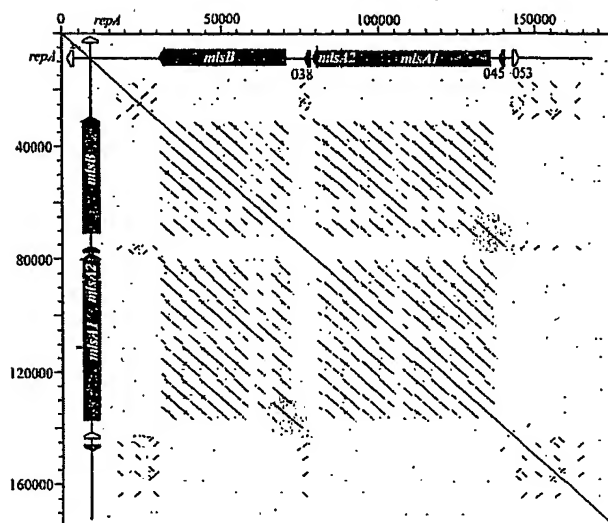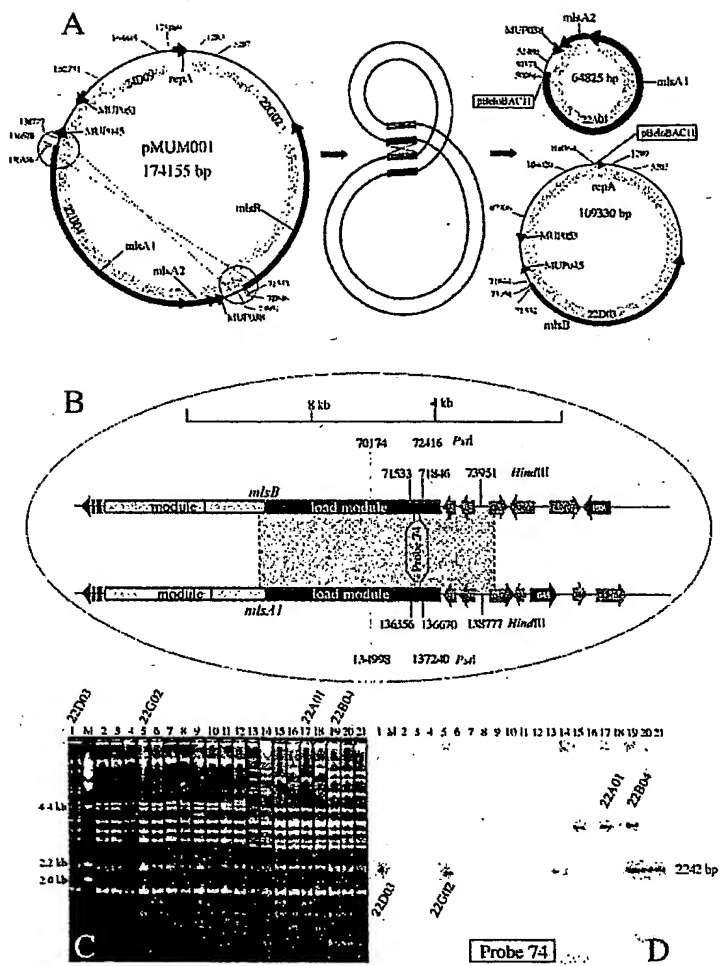
FIGURE 26

FIGURE 27A - FIGURE 27B - FIGURE 27C - FIGURE 27D
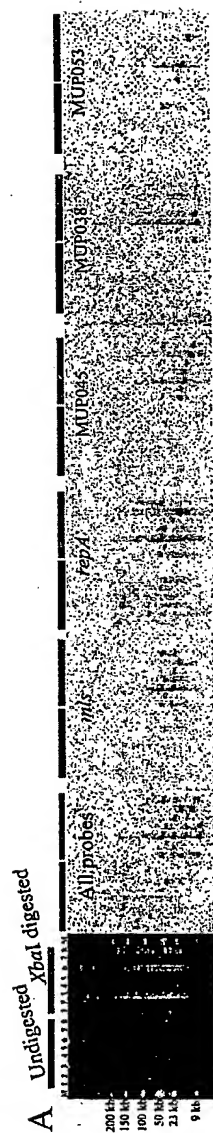
FIGURE 28A   FIGURE 28B
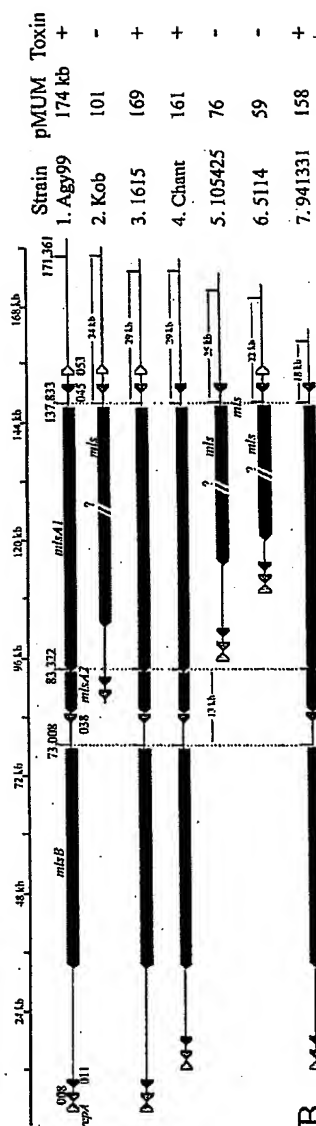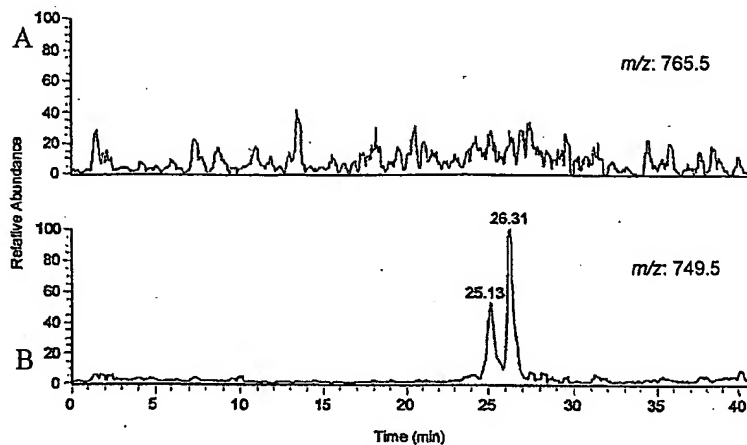
FIGURE 29A - FIGURE 29B
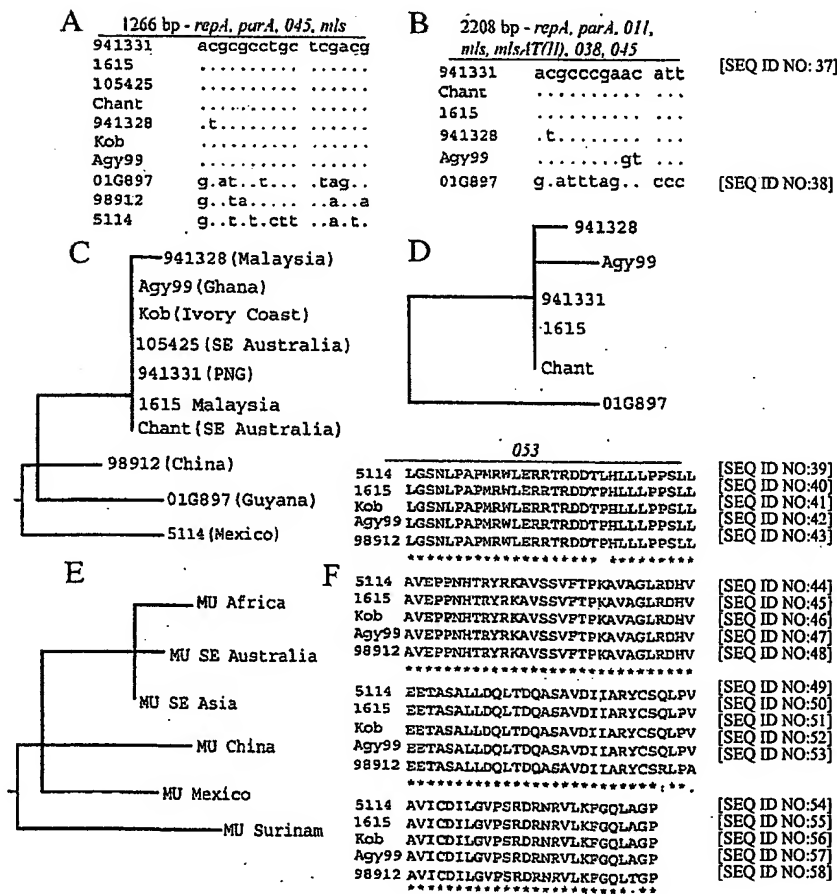
FIGURE 30A - FIGURE 30B - FIGURE 30C - FIGURE 30D -FIGURE 30E - FIGURE 30F

FIGURE 31A

FIGURE 31B

FIGURE 32

FIGURE 33

C-term MlsB MU Agy99

module 7

module 6

DH KR   DH KR

KS ATp ACP KS AT$\underline{a}$ ACP (TE)

F   ----- 5 kbp ----- R

C-term MlsB
MU 98912   module 7

DH KR

KS AT$\underline{p}$ ACP (TE)
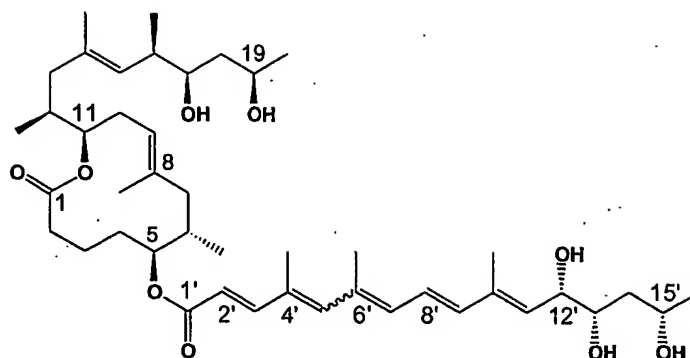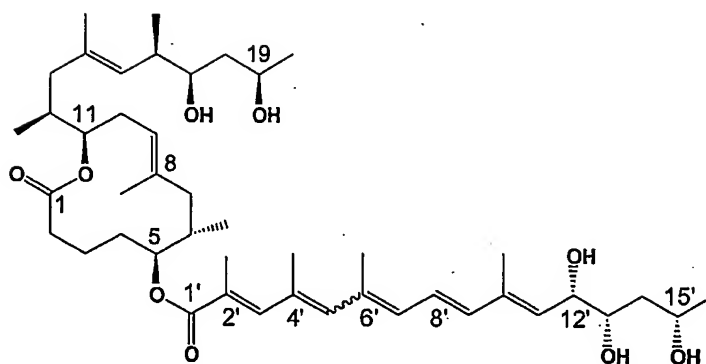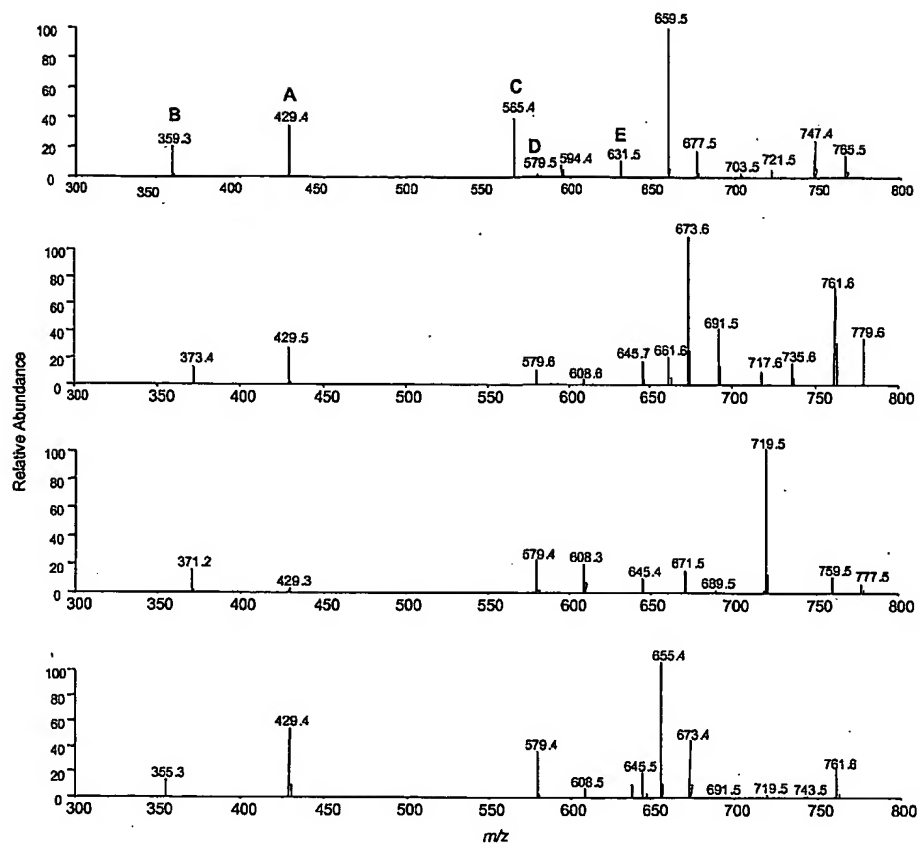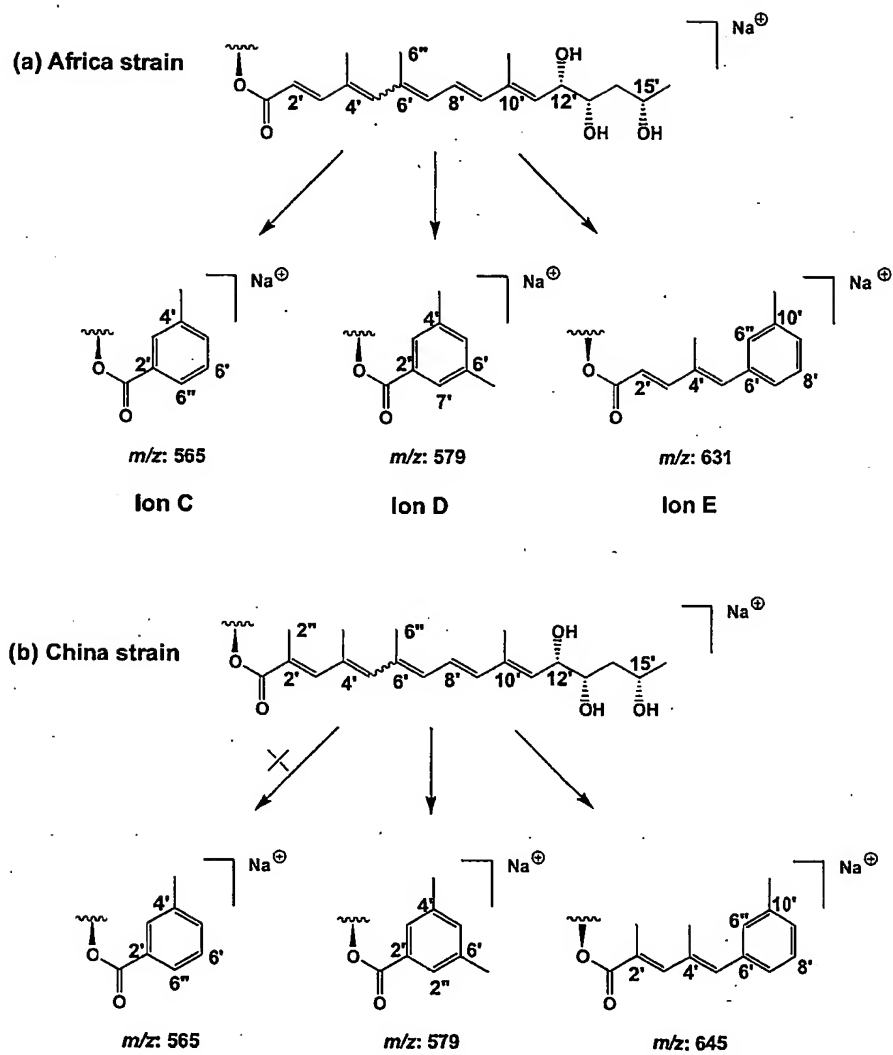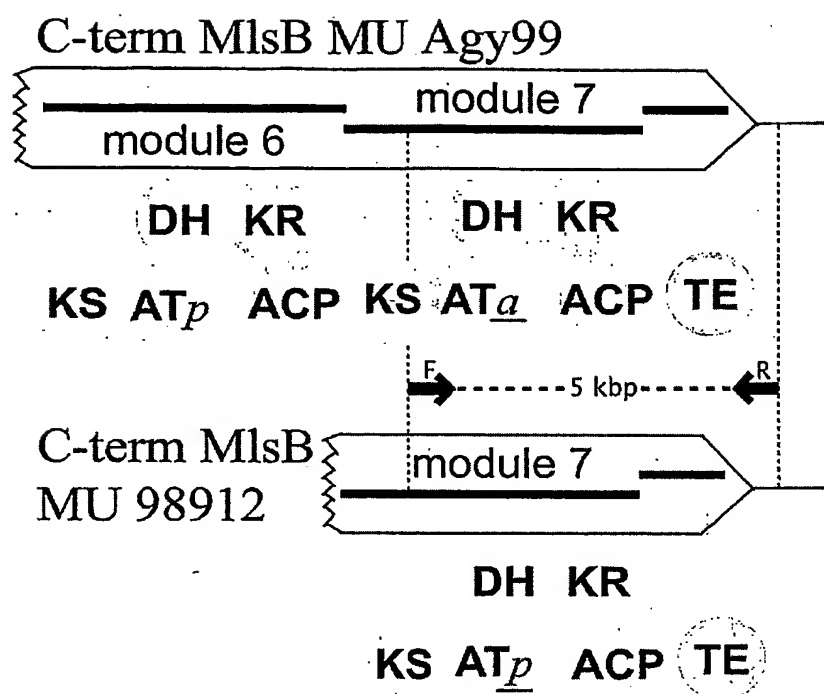
FIGURE 34

```
Agy99 -AT6   PHRATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQCG
98912 -AT7   PHRATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQCG
Agy99 -AT7   PHRATITTSIEHHSENNHDTTDALAALHALANNGTHPLLSRGLLTPQGPGKTVFVFPGQCG
             ************************************************************

Agy99 -AT6   SQYPGMGADLYRQFPVFAHALDACDAALQPFTGWSVLAVLHDE---PEAPSLERVDVVQP
98912 -AT7   SQYPGMGADLYRQFPVFAHALDACDAALQPFTGWSVLAVLHDE---PEAPSLERVDVVQP
Agy99 -AT7   SQYPGMGADLYRQFPVFAHALDEVAAALNPHLDVALLEVMFSQQDTAMAQLLDQTFYAQP
             *********************   ***:*    . .::* *:.::       .:*  *::.   :**

Agy99 -AT6   VLFSVMVSLAALWRWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLA
98912 -AT7   VLFSVMVSLAALWRWAGITPDAVIGHSQGEIAAAHVAGALTLPEAAAVVALRSRVLTDLA
Agy99 -AT7   ALFALGTALHRLFTHAGIHPDYLLGHSIGELTAAYAAGVLSLQDAATLVTSRGRLMQSCI
             .**::  .:*   *:   *** **   ::*** **::**.:**.*:*:.:**::*:   *.*::

Agy99 -AT6   GAGAMASVLSPEEPLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLITCEHENIDA
98912 -AT7   GAGAMASVLSPEEPLTQLLARWDGKITVAAVNGPASAVVSGDTTAITELLTTCEHENIDA
Agy99 -AT7   PGGTMLALQASEAEVQPLLEGLDHAVSIAAINGATSIVLSGDHDSLEQIGEHFITQDRRT
              . :* ::: :.*   :.  **     *   ::.:**:**.:*  *:*.***      ::        :: 

Agy99 -AT6   RAIPVLYPSHSPYMEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYW
98912 -AT7   RAIPVLYPSHSPYMEHIRHQFLDELPELTPRPSTIAMYSTVDGEPHDTAYDTTTMTADYW
Agy99 -AT7   TRLQVSHAFHSPHMDPILEQFRQIAAQLTFSAPTLPILSNLTG---QIARHDQLASPDYW
              :  *.::   ***:*:  * .**   :  ..:**    .:*:.:  *.:  *        .      :.**

Agy99 -AT6   YRNIRNTVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRP
98912 -AT7   YRNIRNTVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRP
Agy99 -AT7   TQQLRNTVRFHDTVAALLGAGEQVFLELSPHPVLTQAITDTVEQAGGGGAAVPALRKDRP
              :: :.************************************************************

Agy99 -AT6   DAVAFAAALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAM
98912 -AT7   DAVAFAAALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAM
Agy99 -AT7   DAVAFAAALGQLHCHGISPSWNVLYCQARPLTLPTYAFQHQRYWLLPTAGDFSGANTHAM
             ************************************************************
```
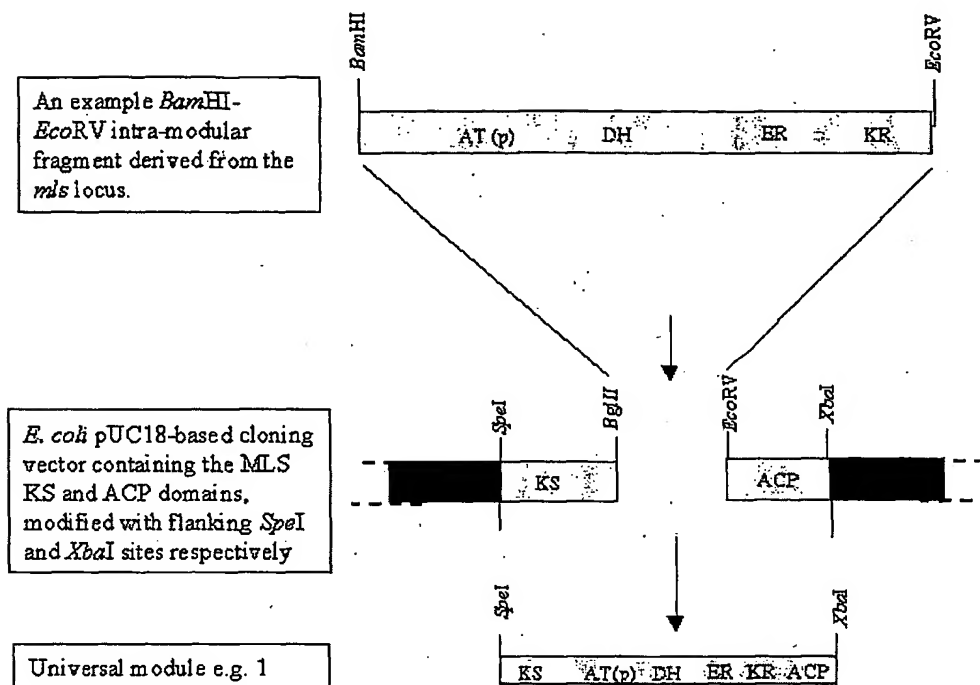
FIGURE 35

An example *Bam*HI-*Eco*RV intra-modular fragment derived from the *mls* locus.

E. coli pUC18-based cloning vector containing the MLS KS and ACP domains, modified with flanking *Spe*I and *Xba*I sites respectively

Universal module e.g. 1

FIGURE 36

FIGURE 37